







Ontario. Legislative assembly.  
Sessional papers.











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122

# SESSIONAL PAPERS



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THIRD SESSION

OF THE

THIRTEENTH LEGISLATURE

OF THE

PROVINCE OF ONTARIO



SESSION 1914

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# LIST OF SESSIONAL PAPERS

PRESENTED TO THE HOUSE DURING THE SESSION.

TITLE.	No.	REMARKS
Accounts, Public .....	1	<i>Printed.</i>
Agricultural College, Report .....	30	"
Agricultural and Experimental Union, Report .....	32	"
Agricultural Societies, Report .....	42	"
Agriculture, Department of, Report .....	29	"
Almonte High School, correspondence .....	103	<i>Not Printed.</i>
Algonquin Park Forest Reserve .....	72	<i>Printed.</i>
Archivist, Report .....	51	"
Auditor, Statement of .....	54	"
Bee-Keepers', Report .....	37	<i>Printed.</i>
Bilingual Schools, correspondence with Bishop Fallon ...	101	<i>Not Printed.</i>
Bilingual Schools, correspondence with Bishop Scollard .	102	"
Births, Marriages and Deaths, Report .....	20	<i>Printed.</i>
Canada Temperance Act, attitude of officials in Welland.	76	<i>Not Printed.</i>
Children, Dependent, Report .....	27	<i>Printed.</i>
Coal supply for Public Institutions .....	74	<i>Not Printed.</i>
Colcock, N.B., moneys advanced to .....	60	"
Cole's Report, Mining Engineer T. & N.O.....	88	<i>Printed.</i>
Common Gaols, official regulations .....	92	"
Consolidated Revenue Fund, Orders-in-Council .....	63	<i>Not Printed.</i>
Corn Growers' Association, Report .....	35	<i>Printed.</i>
Dairymen's Association, Report .....	38	<i>Printed.</i>
Division Courts, Report .....	5	"
Division Courts, Revised Rules and Orders .....	71	"
Education, Report .....	17	<i>Printed.</i>
Education, Orders-in-Council .....	55	"
Education, grants to rural public schools .....	77	<i>Not Printed.</i>
Education, investigation by Dr. Merchant .....	86	"
Education, grants withheld .....	98	"
Education, correspondence, Almonte School .....	103	"
Education, authorized text-books .....	104	"

TITLE.	No.	REMARKS.
Elections, return from Records .....	50	<i>Printed.</i>
Electric Railways, Report for or against .....	62	"
Employers' Liability, for Compensation to Employees..	53	"
Entomological Society, Report .....	36	"
Epileptics Hospital, Report .....	23	"
Estimates .....	2	"
Factories, Report .....	46	<i>Printed.</i>
Farmers' Institutes, Report .....	40	"
Feeble-minded, Report .....	24	"
Forest Reserves—Pembroke Lumber Company .....	72	"
Friendly Societies, Report .....	11	<i>Printed.</i>
Fruit Growers', Report .....	44	"
Fruits of Ontario .....	33	"
Game and Fish, Report .....	14	<i>Printed.</i>
Goodman, prosecution of correspondence .....	59	<i>Not Printed.</i>
Good Roads Commission, Report .....	84	<i>Printed.</i>
Grand River, overflow, correspondence .....	58	<i>Not Printed.</i>
Guelph Prison Farm, buildings erected .....	75	"
Hamilton Athletic Association, correspondence .....	79	<i>Not Printed.</i>
Health, Report .....	21	<i>Printed.</i>
Health, Special Report .....	21a	"
Highway Improvement, Report .....	15	"
Horticultural Societies, Report .....	43	"
Hospitals and Charities, Report .....	25	"
Hospitals and Charities, Regulations .....	91	"
Hydro-Electric Power Commission, Report .....	48	"
Hydro-Electric Power Commission, moneys spent on line from Morrisburg to Prescott .....	87	<i>Not Printed.</i>
Idiots and Epileptics, Report .....	23	<i>Printed.</i>
Industrial Farms, Official Regulations .....	93	"
Industries, Report of Bureau .....	45	"
Insane Hospitals, Report .....	22	"
Insane Hospitals, Regulations .....	95	"
Insane Hospitals, Bulletin .....	56	"
Insurance, Report .....	10	"
Kenora, action against, correspondence .....	70	<i>Not Printed.</i>
Labour, Report .....	16	<i>Printed.</i>
Lands, Forests and Mines, Report .....	3	"
Legal Offices, Report .....	6	"
Library, Report .....	52	<i>Not Printed.</i>



TITLE.	No.	REMARKS.
Liquor License Acts, Report .....	28	<i>Printed.</i>
Liquor License Holders in Toronto .....	69	<i>Not Printed.</i>
Live Stock Associations, Report .....	39	<i>Printed.</i>
Loan Corporations, Statements .....	12	"
Local Option, convictions .....	89	<i>Not Printed.</i>
Mercer Reformatory, Regulations .....	90	<i>Printed.</i>
Meredith, Sir William R., moneys paid to .....	80	<i>Not Printed.</i>
Murray, Mather & Co., option to .....	82	"
Mines, Report of Bureau .....	4	<i>Printed.</i>
Municipal Drainage, Order-in-Council .....	85	"
McKelvie, Overseer, conduct of .....	59	<i>Not Printed.</i>
Northern Ontario, road construction in .....	73	<i>Printed.</i>
Ontario Homes Company, charter of .....	99	<i>Not Printed.</i>
Ontario Hospitals, Regulations .....	95	<i>Printed.</i>
Ontario Railway and Municipal Board, Report .....	49	"
Ontario Reformatory, Regulations .....	94	"
Ontario Vegetable Growers', Report .....	34	"
Pembroke Lumber Company .....	72	<i>Printed.</i>
Power Commission Act, Orders-in-Council .....	97	<i>Not Printed.</i>
Prison Farm, buildings on .....	75	"
Prisons and Reformatories, Report .....	26	<i>Printed.</i>
Provincial Auditor, Statements .....	54	"
Provincial Conference, Proceedings .....	67	"
Provincial Municipal Auditor, Report .....	8	"
Provincial securities sold .....	64	<i>Not Printed.</i>
Public Accounts, 1913 .....	1	<i>Printed.</i>
Public Health, Report .....	21	"
Public Institutions, coal for .....	74	<i>Not Printed.</i>
Public Works, Report .....	13	<i>Printed.</i>
Queen Victoria N. F. Park, Report.....	9	<i>Printed.</i>
Railway and Municipal Board, Report.....	49	<i>Printed.</i>
Registrar-General, Report .....	20	"
Registry Offices, Report .....	7	"
Road Construction in Northern Ontario .....	73	"
Rondeau Provincial Park, Regulations .....	57	"
Secretary and Registrar, Report .....	19	<i>Printed.</i>
Smuck, William, license application .....	66	<i>Not Printed.</i>
Statute distribution .....	96	"
Surrogate Court, Orders-in-Council .....	61	"

TITLE.	No.	REMARKS.
Taylor, Scott & Co., amount received from .....	68	<i>Not Printed.</i>
Taylor, Mr., evidence of .....	83	"
Text-books, authorized .....	104	"
Timber Limits, sold .....	65	"
Timiskaming & N. O. Ry. Commission, Report .....	47	<i>Printed.</i>
Timiskaming & N. O. Ry., Cole's Report .....	88	"
Timiskaming & N. O. Ry., settlers' effects, over .....	100	<i>Not Printed.</i>
Toronto Liquor License Holders .....	69	"
Toronto University, Report .....	18	<i>Printed.</i>
Toronto University, cost of heating plant .....	78	<i>Not Printed.</i>
Toronto University, <i>re</i> deficit .....	81	"
Vegetable Growers', Report .....	34	<i>Printed.</i>
Veterinary College, Report .....	31	"
Whitson's Report on road construction in New Ontario.	73	<i>Printed.</i>
Women's Institutes, Report .....	41	"
Workmen's Compensation, Report .....	53	"

# LIST OF SESSIONAL PAPERS

Arranged in Numerical Order with their Titles at full length; the dates when presented to the Legislature; the name of the Member who moved the same, and whether ordered to be Printed or not.

---

## CONTENTS OF PART I.

- No. 1 Public Accounts of the Province for the year ending 31st October, 1913. Presented to the Legislature, 3rd March, 1914. *Printed.*
- No. 2 Estimates—Supplementary, for the service of the Province for the year ending 31st October, 1913-14. Presented to the Legislature, 27th February and 9th April, 1914. *Printed.* Estimates for the year ending 31st October, 1915. Presented to the Legislature, April 21st, 1914. *Printed.*

## CONTENTS OF PART II.

- No. 3 Report of the Department of Lands, Forests and Mines for the year 1913. Presented to the Legislature, April 15th, 1914. *Printed.*
- No. 4 Report of the Bureau of Mines for the year 1913. Presented to the Legislature, April 1st, 1914. *Printed.*
- No. 5 Report of the Inspector of Division Courts for the year 1913. Presented to the Legislature, March 11th, 1914. *Printed.*
- No. 6 Report of the Inspector of Legal Offices for the year 1913. Presented to the Legislature, April 1st, 1914. *Printed.*
- No. 7 Report of the Inspector of Registry Offices for the year 1913. Presented to the Legislature, April 17th, 1914. *Printed.*
- No. 8 Report of the Provincial Municipal Auditor for the year 1913. Presented to the Legislature, April 16th, 1914. *Printed.*
- No. 9 Report of the Commissioners for the Queen Victoria Niagara Falls Park for the year 1913. Presented to the Legislature, April 15th, 1914. *Printed.*

## CONTENTS OF PART III.

- No. 10 Report of the Department of Insurance for the year 1913. Presented to the Legislature, March 20th, 1914. *Printed.*
- No. 11 Report of the Registrar of Friendly Societies for the year 1914. Presented to the Legislature, March 20th, 1914. *Printed.*

**CONTENTS OF PART IV.**

- No. 12    Loan Corporations Statements made by Building Societies, Loan Companies, Loaning Land and Trust Companies for the year 1913. Presented to the Legislature, March 20th, 1914. *Printed.*
- No. 13    Report of the Department of Public Works for the year 1913. Presented to the Legislature, March 11th, 1913. *Printed.*
- No. 14    Report of the Game and Fisheries Department for the year 1913. Presented to the Legislature, February 27th, 1914. *Printed.*

**CONTENTS OF PART V.**

- No. 15    Report on Highway Improvement in the Province for the year 1913. Presented to the Legislature, April 16th, 1914. *Printed.*
- No. 16    Report of the Bureau of Labour for the year 1913. Presented to the Legislature, March 11th, 1914. *Printed.*

**CONTENTS OF PART VI.**

- No. 17    Report of the Department of Education for the year 1913. Presented to the Legislature, March 12th, 1914. *Printed.*

**CONTENTS OF PART VII.**

- No. 18    Report of the University of Toronto Board of Governors for the year ending 30th June, 1913. Presented to the Legislature, March 18th, 1914. *Printed.*
- No. 19    Report of the Secretary and Registrar of the Province for the year 1913. Presented to the Legislature, April 15th, 1914. *Printed.*
- No. 20    Report of the Registrar-General upon Births, Marriages and Deaths for the year 1913. Presented to the Legislature, March 27th, 1913. *Printed.*
- No. 21    Report of the Provincial Board of Health for the year 1913. Presented to the Legislature, March 16th, 1914. *Printed.*
- No. 21a    Special Report of the Provincial Board of Health on the work of the District Officers of Health for the year 1912-13. Presented to the Legislature, March 6th, 1914. *Printed.*

**CONTENTS OF PART VIII.**

- No. 22    Report upon the Hospitals for the Insane for the year 1913. Presented to the Legislature, April 21st, 1914. *Printed.*



- No. 23 Report upon the Hospitals for Idiots and Epileptics at Orillia and Woodstock for the year 1913. Presented to the Legislature, April 28th, 1914. *Printed.*
- No. 24 Report upon the Feeble-minded of the Province for the year 1913. Presented to the Legislature, April 23rd, 1914. *Printed.*
- No. 25 Report upon the Hospitals and Charities for the year 1913. Presented to the Legislature, April 14th, 1914. *Printed.*
- No. 26 Report upon the Prisons and Reformatories of the Province for the year 1913. Presented to the Legislature, April 21st, 1914. *Printed.*
- No. 27 Report on Neglected and Dependent Children for the year 1913. Presented to the Legislature, April 15th, 1914. *Printed.*
- No. 28 Report upon the operation of the Liquor License Acts, Ontario, for the year 1913. Presented to the Legislature, February 27th, 1914. *Printed.*

### CONTENTS OF PART IX.

- No. 29 Report of the Department of Agriculture for the year 1913. Presented to the Legislature, April 22nd, 1914. *Printed.*
- No. 30 Report of the Agricultural College for the year 1913. Presented to the Legislature, April 22nd, 1914. *Printed.*
- No. 31 Report of the Veterinary College for the year 1913. Presented to the Legislature, April 22nd, 1914. *Printed.*
- No. 32 Report of the Agricultural and Experimental Union for the year 1913. Presented to the Legislature, April 22nd, 1914. *Printed.*
- No. 33 The Fruits of Ontario. Presented to the Legislature, April 9th, 1914. *Printed.*
- No. 34 Report of the Vegetable Growers' Association for the year 1913. Presented to the Legislature, April 16th, 1914. *Printed.*
- No. 35 Report of the Corn Growers' Association for the year 1913. Presented to the Legislature, April 22nd, 1914. *Printed.*
- No. 36 Report of the Entomological Society for the year 1913. Presented to the Legislature, April 22nd, 1914. *Printed.*

**CONTENTS OF PART X.**

- No. 37 Report of the Bee-Keepers' Association for the year 1913. Presented to the Legislature, April 22nd, 1914. *Printed.*
- No. 38 Report of the Dairymen's Association for the year 1913. Presented to the Legislature, April 22nd, 1914. *Printed.*
- No. 39 Report of the Live Stock Associations for the year 1913. Presented to the Legislature, March 3rd, 1914. *Printed.*
- No. 40 Report of the Farmer's Institutes for the year 1913. Presented to the Legislature, April 9th, 1914. *Printed.*
- No. 41 Report of the Women's Institutes for the year 1913. Presented to the Legislature, April 9th, 1914. *Printed.*
- No. 42 Report of the Agricultural Societies of the Province for the year 1913. Presented to the Legislature, April 9th, 1914. *Printed.*
- No. 43 Report of the Horticultural Societies of the Province for the year 1913. Presented to the Legislature, April 22nd, 1914. *Printed.*
- No. 44 Report of the Fruit Growers' Association for the year 1913. Presented to the Legislature, April 22nd, 1914. *Printed.*
- No. 45 Report of the Bureau of Industries for the year 1913. Presented to the Legislature, April 23rd, 1914. *Printed.*
- No. 46 Report of the Inspectors of Factories for the year 1913. Presented to the Legislature, April 22nd, 1914. *Printed.*

**CONTENTS OF PART XI.**

- No. 47 Report of the Timiskaming and Northern Ontario Railway Commission for the year 1913. Presented to the Legislature, March 23rd, 1914. *Printed.*
- No. 48 Report of the Hydro-Electric Power Commission for the year 1913. Presented to the Legislature, March 16th, 1914. *Printed.*

**CONTENTS OF PART XII.**

- No. 49 Report of the Ontario Railway and Municipal Board for the year 1913. Presented to the Legislature, April 24th, 1914. *Printed.*
- No. 50 Return from the Records of the Bye-elections held on the second day of June, the fourteenth day of July, the eighth day of September, and the twenty-seventh day of November, 1913. Presented to the Legislature, February 18th, 1914. *Printed.*
- No. 51 Report of the Provincial Archivist for the year 1913. Presented to the Legislature, April 15th, 1914. *Printed.*



## CONTENTS OF PART XIII.

- No. 52 Report upon the state of the Library. Presented to the Legislature, April 23rd, 1914. *Not Printed.*
- No. 53 Final Report of Commissioner on Laws relating to the Liability of Employers to make Compensation to their Employees. Presented to the Legislature, March 27th, 1914. *Printed.*
- No. 54 Statements of Provincial Auditor for the year 1912-13. Presented to the Legislature, March 19th, 1914. *Printed.*
- No. 55 Copies of Orders-in-Council and Regulations under section 27 of the Department of Education Act. Presented to the Legislature, February 25th, 1914. *Printed.*
- No. 56 Bulletin of the Ontario Hospitals for the Insane. Presented to the Legislature, February 27th, 1914. *Printed.*
- No. 57 Regulations respecting Rondeau Provincial Park, 1913. Presented to the Legislature, February 27th, 1914. *Printed.*
- No. 58 Return to an Order of the House of the 27th March, 1913, for a Return showing:—1. Copies of all correspondence between the Minister of Public Works or any other member of the Government or any official thereof, and any person or persons relating to the floods on the Grand River or any other river in the Province during the years 1908, 1909, 1910, 1911, 1912. 2. Copies of all petitions received during the said years by the Government or any Minister of the Government from any person or persons relating to the floods on the Grand River or any other river in the Province, or requesting the Government to take action towards the prevention of floods. 3. Copies of all reports made by any engineer or engineers employed on behalf of the Government or on behalf of the Hydro-Electric Power Commission, for the purpose of investigating the floods on the Grand River or any other river in the Province, or the means of preventing or mitigating such floods or of conserving and regulating the flow of such rivers or investigating the electrical power potentialities of such rivers. Presented to the Legislature, February 27th, 1914. *Mr. Marshall. Not Printed.*
- No. 59 Return to an Order of the House of the 22nd April, 1913, for a Return showing:—Copies of all correspondence between the Attorney-General or any other member of the Government or any official of the Government and any other person or persons relating to:—1. The prosecution of one Goodman, formerly Chief of Police at New Liskeard on November 12th last, for an offence against the Game Laws. 2. The conduct of one McKelvie, an overseer of the Game and Fisheries Department at

New Liskeard, Ont., or the dismissal of the said McKelvie from his position. 3. The prosecution of one Eli Tibbs in November, 1912, for illegal possession of furs. 4. The prosecution of any party or parties for illegal possession of furs seized by the said McKelvie from one Angus Wabi. Presented to the Legislature, February 27th, 1914. Mr. *Elliott*. *Not Printed*.

- No. 60 A Return to an Order of the House of the 15th April, 1913, for a Return showing:—1. In detail the persons to whom the sum of \$19,946.18, appearing on page 323 of the Public Accounts, 1912, was advanced by N. B. Colcock, and the purposes for which the same was advanced. 2. In detail the persons to whom the sum of \$11,060.85, appearing on page 372 of the Public Accounts was paid by N. B. Colcock, and the purposes for which the same was paid. Presented to the Legislature, March 3rd, 1914. Mr. *Anderson (Bruce)*. *Not Printed*.
- No. 61 Copies of Orders-in-Council authorizing payments out of Surrogate of the Counties of York and Simcoe in accordance with the provisions of the Surrogate Courts Act. Presented to the Legislature, March 10th, 1914. *Not Printed*.
- No. 62 Return to an Order of the House of the 11th March, 1913, for a Return showing for what Municipalities was the Report of the Lieutenant-Governor in Council in favour of, or against, building an electric railway for such Municipalities. Presented to the Legislature, March 16th, 1914. Mr. *Elliott*. *Printed*.
- No. 63 Copies of Orders in Council in accordance with the provisions of sec. 2, cap. 2, 2 George V, An Act for raising money on the Credit of the Consolidated Revenue Fund of Ontario. Presented to the Legislature, March 16th, 1914. *Not Printed*.
- No. 64 Return to an Order of the House of the 2nd March, 1914, for a Return showing:—1. What securities have been sold by the Province since October 31st, 1912. 2. What was the date of the sales. 3. What are the names of the purchasers. 4. What are the prices at which such securities were sold. Presented to the Legislature, March 16th, 1914. Mr. *Sinclair*. *Not Printed*.
- No. 65 Return to an Order of the House of the 27th February, 1914, for a Return showing:—1. What timber limits, or areas, have been sold by the Government since the first day of January, 1913, and the total area of each. 2. The price at which each such limit, or area, was sold. 3. The names of the respective purchasers and if any were sold at public auction. 4. And if any were so sold at auction, which limit or area was so sold, and the dates on which the several sales took place. Presented to the Legislature, March 18th, 1914. Mr. *Mageau*. *Not Printed*.

- No. 66 Return to an Order of the House of the 6th March, 1914, for a Return showing:—1. Application for license of William Smuck of the Township of Bayham in the electoral district of East Elgin for the year 1913-14; the granting thereof; the withdrawal of such application; all correspondence between the Department and any officer thereof and the said Smuck, or the License Inspector or other residents of East Elgin in reference thereto. 2. The application of the said Smuck to be appointed License Inspector for East Elgin, and all protests against his appointment. 3. All letters, reports or communications in reference to the health or work by the former License Inspector, Mr. W. R. Andrews. 4. The resignation of the former License Inspector or Notice of the Termination of his employment. 5. All protests or complaints during the years 1912, 1913 and 1914 from residents of Aylmer or other citizens of East Elgin in reference to the lack of enforcement of the License Law and the conduct of the hotels in Aylmer or of license officials of East Elgin. Presented to the Legislature, March 27th, 1914. Mr. Rowell. *Not Printed.*
- No. 67 Minutes of the Proceedings in Conference of the Representatives of the Provinces, October, 1913. Presented to the Legislature, March 19th, 1914. *Printed.*
- No. 68 Return to an Order of the House of the 2nd March, 1914, for a Return showing:—1. What amount was received by the Government from Messrs. Taylor, Scott & Co. for the work done by prisoners from Central Prison under its contract with Taylor, Scott & Co., dated 1st September, 1905, for each year during which the contract was in force. 2. How long was the contract in force. 3. What amounts were paid by the Government for debt, damages or costs respectively in connection with or arising out of the said contract. 4. To whom were such amounts paid. 5. Was the agreement between Taylor, Scott & Co. and the Government changed after the agreement had been submitted to the House and approved by it. 6. If it were changed, were such changes embodied in an agreement in writing between the parties. 7. If it was changed, was such change or modified agreement submitted to the House for approval. Presented to the Legislature, March 23rd, 1914. Mr. Bowman. *Not Printed.*
- No. 69 Return to an Order of the House of the 18th March, 1914, for a Return showing:—1. The names of the license holders under the Liquor License Act in the City of Toronto for the year from 1st May, 1908, to 1st May, 1909, and the place or places of business in which each license holder carried on business. 2. The names of those license holders under the said Act, and the location of the premises in which they carried on business, whose licenses were cut off or were not renewed in the year



1909 in Toronto. 3. The names of the license holders in Toronto whose licenses were transferred with the approval of the Board of License Commissioners in the years 1909, 1910, 1911, 1912 and 1913; the places in which they carried on business; the names of the persons to whom licenses were transferred; and the locations of the premises in which the persons to whom the licenses were transferred carried on business. Presented to the Legislature, March 23rd, 1914. Mr. *Proudfoot*. *Not Printed*.

- No. 70     Return to an Order of the House of the 26th March, 1913, for a Return showing:—1. All the correspondence (including telegrams) passing between the Prime Minister, the Attorney-General, the Minister of Crown Lands or any other member or official of the Government and the Counsel or Solicitors for Keewatin Power Company, or the Counsel or Solicitors for the Hudson's Bay Company with reference to the action brought by these Companies against the Town of Kenora for a declaration that they and not the Crown were the owners of the water power on the East Branch of the Winnipeg River, and that the lease from the Crown to the Town of Kenora was invalid. 2. A copy of the telegram (if any) sent by the Prime Minister to the Counsel for the Keewatin Power Company advising him that the Government did not desire to defend its own title to the water power or be added as a party to the action. 3. All correspondence (including telegrams) passing between the Town of Kenora or the Counsel or Solicitors for the Town of Kenora, and the Government or any Minister or official thereof with reference to these actions, and particularly all communications requesting the Crown to take part in the defence of its own title to the water power. 4. Copies of all correspondence (including telegrams) passing between the Prime Minister, Attorney-General, the Minister of Crown Lands or any other Minister or official of the Government, and Mr. W. H. Hearst, acting as Counsel for the Government, in reference to these actions. 5. Copy of the judgments of the Trial Judge and the Court of Appeal. Presented to the Legislature, March 24th, 1914. Mr. *Rowell*. *Not Printed*.
- No. 71     Revised Rules, Orders and Forms of the Division Courts of the Province of Ontario. Presented to the Legislature March 26th, 1914. *Printed*.
- No. 72     Correspondence and Papers relating to timber in the Algonquin Park Forest Reserve. Presented to the Legislature, March 27th, 1914. *Printed*.
- No. 73     Whitson's Report upon Road Construction in Northern Ontario. Presented to the Legislature, March 30th, 1914. *Printed*.

- No. 74 Return to an Order of the House of the 27th February, 1914, for a Return showing:—1. The names of the tenderers for the supply of coal for Government Institutions, in Toronto, during the years 1910, 1911, 1912 and 1913, respectively. 2. The amount of each tender for each of such years. 3. The names of the contractor or contractors for each of such years. 4. The amount of coal supplied under each contract during each year. 5. The prices at which the coal was purchased. Presented to the Legislature, March 31st, 1914. Mr. *Bowman*. *Not Printed*.
- No. 75 Return to an Order of the House of the 27th February for a Return showing:—1. What buildings have been erected by the Province at the Prison Farm at Guelph. 2. What has been the total cost to the Province of each building. 3. Were any of these buildings built by prison labour in whole or in part. 4. If so, what buildings, and what class of prison labour was employed. 5. And if the statement of cost makes any allowance for the prison labour employed, if any. Presented to the Legislature, March 31st, 1914. Mr. *Atkinson*. *Not Printed*.
- No. 76 Return to an Order of the House of the 18th March, 1914, for a Return showing:—1. Whether the Minister of Agriculture or any officer or official of his Department, or the Minister of Education or any officer or official of his Department, communicated with the district representative of Agriculture within the County of Welland with reference to his attitude to the Canada Temperance Act or the vote to be taken thereon on the 29th January last. 2. And if any communication was made, was such communication verbal or in writing. 3. And who was the officer making the same, and what was the date thereof. Presented to the Legislature, March 31st, 1914. *Not Printed*.
- No. 77 Return to an Order of the House of the 27th March, 1914, for a Return showing:—1. The conditions upon which grants are made to rural public schools. 2. Were the grants to the rural public schools of Ontario in 1913 less per school in 1913 than they were in the year 1912. If so, how much. 3. Has the Department of Education notified the Boards of Public School Trustees of Rural Schools, or any of them, that they cannot pay the grant provided for by the regulations. 4. If such notice has been given, upon what their ground for refusing to pay the grants. 5. Has the Department of Education notified the School Boards of Rural Schools, or any of them, that the grants this year would be cut down 28 *per cent.*, or any amount whatever. If so, how much. Presented to the Legislature, April 1st, 1914. Mr. *Kohler*. *Not Printed*.
- No. 78 Return to an Order of the House of the 30th March, 1914, for a Return showing:—1. What was the estimated cost of the heating plant for the Toronto University. 2. What was the actual cost of the plant when fully completed. 3. Has the total amount

been paid; if not, what amount, if any, is held in reserve.  
4. And if the heating plant is giving satisfaction. Presented to the Legislature, April 1st, 1914. Mr. *Bowman*. *Not Printed*.

- No. 79 Return to an Order of the House of the 1st April, 1914, for a Return of copies of all correspondence, resolutions or other documents received by, or on behalf of any Member of the Government in any way relating to the Hamilton Athletic Association regarding which certain legislation is sought for during the current Session. Presented to the Legislature, April 2nd, 1914. Mr. *Studholme*. *Not Printed*.
- No. 80 Return to an Order of the House of the 1st April, 1914, for a Return showing:—1. What sum of money has Sir William Meredith, the Chief Justice of Ontario, received from the Government in addition to his salary as Chief Justice, since January 1st, 1909, to date. 2. In what capacity did Chief Justice Sir William Meredith receive such sum or sums, and what amount was received with respect to each capacity in which he received any sum or sums as aforesaid. Presented to the Legislature, April 2nd, 1914. Mr. *Anderson (Bruce)*. *Not Printed*.
- No. 81 Return to an Order of the House of the 27th March, 1914, for a Return showing:—1. If there was a deficit in the financial operations of the Provincial University for the fiscal year ending 1912. If so, how much. 2. Was there a deficit in the financial operations of the Provincial University for the fiscal year 1913. If so, how much. 3. If there have been deficits during the years 1912-13, or either of them, how have these deficits been provided for. 4. What is the estimated expenditure of the Provincial University for the current fiscal year. 5. What is the estimated revenue of the University for the current fiscal year. Presented to the Legislature, April 2nd, 1914. Mr. *Marshall*. *Not Printed*.
- No. 82 Return to an Order of the House of the 27th March, 1914, for a Return showing:—1. If there was an option given to the firm of Murray, Mather & Co. to purchase certain Government securities during the calendar year 1913. 2. If so, what was the date of the option, and what were the character, amount and price of the securities covered by it. 3. Was such option, if any, exercised; and if so, to what extent. Presented to the Legislature, April 3rd, 1914. Mr. *Sinclair*. *Not Printed*.
- No. 83 Return to an Order of the House of the 27th March, 1914, for a Return showing:—1. Copy of evidence of Mr. Taylor, of Messrs. Taylor, Scott & Co., given before the Dominion Penitentiary Investigation Commission, of which Mr. G. M. Macdonald, K.C., of Kingston, is Chairman, and which was taken in Shorthand by a Stenographer provided by Dr. Gilmour,



Warden of the Central Prison, such evidence or a copy thereof being now in the custody or control of the Provincial Secretary, or of some of the officers or officials of his Department, or of the institutions under the control of his Department. 2. Copies of all correspondence passing between the Provincial Secretary, or any officer or official of his Department, or any officer or official of any of the institutions under the charge of his Department, and Mr. Joseph Downey, in reference to the said evidence or the production thereof. Presented to the Legislature, April 3rd, 1914. *Mr. Bowman. Not Printed.*

- No. 84 Report of the Good Roads Commission. Presented to the Legislature, April 7th, 1914. *Printed.*
- No. 85 Copy of an Order-in-Council approved by His Honour the Lieutenant-Governor, under the provisions of 552 of sec. 18 of the Municipal Drainage Act. Presented to the Legislature, April 8th, 1914. *Printed.*
- No. 86 Return to an Order of the House of the 2nd March, 1913, for a Return showing:—1. Copies of all correspondence between the Minister of Education or any other member or official of the Government and any other person or persons during 1910, 1911 and 1912, relating to the investigation made by Dr. Merchant of the bi-lingual or French-English Schools in Ontario. 2. Copies of all correspondence between the Minister of Education or any other member or official of the Government and any other person or persons during the year 1912, relating to Regulation No. 17. Presented to the Legislature, April 9th, 1914. *Mr. Mageau. Not Printed.*
- No. 87 Return to an Order of the House of the 7th April, 1914, for a Return showing:—1. How much the Hydro-Electric Power Commission has spent in building the trunk line from Morrisburg to Prescott, and from Morrisburg to Winchester and Chertville. 2. Did the Hydro-Electric Power Commission enter into an agreement with the New York and Ontario Power Company, or any person on their behalf, for a supply of power for transmission on this line, to be developed at Waddington or elsewhere; and if so, what is the date of such agreement. 3. Was it a term of any such agreement that the Directors of the New York and Ontario Power Company became personally liable if power was not supplied within a certain defined time. 4. Has the Hydro-Electric Power Commission entered into any agreement with the Rapids Power Company for the supply of power; if so, what is the date of such agreement. Presented to the Legislature, April 9th, 1914. *Not Printed.*
- No. 88 Coles' Report, Mining Engineer, Timiskaming and Northern Ontario Railway Company. Presented to the Legislature, April 28th, 1914. *Printed.*

- No. 89    Return to an Order of the House of the 8th April, 1914, for a Return showing:—1. The number of convictions for intoxication in Local Option Municipalities. 2. Convictions for other offences against Local Option Law during the license year 1912-13. Presented to the Legislature, April 14th, 1914. *Mr. McPherson. Not Printed.*
- No. 90    Official Regulations for the Government of the Andrew Mercer Reformatory. Presented to the Legislature, April 16th, 1914. *Printed.*
- No. 91    Official Regulations for the Government of the Hospitals and Public Charities of Ontario. Presented to the Legislature, April 16th, 1914. *Printed.*
- No. 92    Official Regulations for the Government of Common Gaols of Ontario. Presented to the Legislature, April 16th, 1914. *Printed.*
- No. 93    Official Regulations for the Government of Industrial Farms in Ontario. Presented to the Legislature, April 16th, 1914. *Printed.*
- No. 94    Official Regulations for the Government of the Ontario Reformatory. Presented to the Legislature, April 16th, 1914. *Printed.*
- No. 95    Official Regulations of the Ontario Hospitals. Presented to the Legislature, April 17th, 1914. *Printed.*
- No. 96    Statement of Statute distribution for 1913. Presented to the Legislature, April 21st, 1914. *Not Printed.*
- No. 97    Return to an Order of the House of the 27th March, 1913, for a Return showing:—Copies of all Orders in Council passed under Section 8, of the Power Commission Act, as amended by the Power Commissions Act, 1912. Presented to the Legislature, April 21st, 1914. *Mr. Mageau. Not Printed.*
- No. 98    Return to an Order of the House of the 1st April, 1914, for a Return showing:—1. All the schools in the Province, both public and separate, from which the Government grant has been withheld during the years 1912 and 1913 respectively. 2. The grounds upon which such grants have been withheld from the said schools respectively. 3. The grounds upon which County Councils are required to withhold from schools the moneys raised by taxation from the people. Presented to the Legislature, April 21st, 1914. *Mr. Racine. Not Printed.*

- No. 99     Return to an Order of the House of the Twenty-first day of April instant for a Return of a Copy of the Letters, or Charter, of the "Ontario Homes Company, Limited," giving the Corporation license to promote a company for the purpose of engaging in the business of the purchase of real estate in manufacturing localities and showing what, if any, returns have been made to the Department and if the company is still doing business. Presented to the Legislature, April 22nd, 1914. Mr. *Studholme*. *Not Printed*.
- No. 100    Return to an Order of the House of the 16th April, 1914, for a Return showing:—The quantity of settlers' effects delivered over the T. & N. O. Railway at New Liskeard and Cochrane, respectively, and carried as such under the regulations of the said Railway, for the financial year ending October 31st, 1913. Presented to the Legislature, April 24th, 1914. Mr. *Atkinson*. *Not Printed*.
- No. 101    Return to an Order of the House of the 17th February, 1913, for a Return of: Copies of all correspondence between Bishop Fallon, of London, and the Provincial Secretary, the Minister of Public Works or any Member of the Government regarding the Bi-lingual Schools in the Province of Ontario, since the first day of May, 1910. Presented to the Legislature, April 24th, 1914. Mr. *Evanturel*. *Not Printed*.
- No. 102    Return to an Order of the House of the 17th February, 1913, for a Return of Copies of all correspondence between Bishop Scollard, of Sault Ste. Marie, and the Government, regarding the Bi-lingual Schools of the Province of Ontario, since the first day of March, 1907. Presented to the Legislature, April 24th, 1914. Mr. *Evanturel*. *Not Printed*.
- No. 103    Return to an Order of the House of the 16th April, 1914, for a Return showing:—1. All correspondence between the Department of Education and any officer or official thereof and the Board of Trustees of the Almonte High School. 2. All correspondence between the Department of Education and any officer or official thereof and any of the teachers in the Almonte High School. 3. All correspondence between the Department of Education and any officer or official thereof and Miss Eade with reference to an application by her for a position in the Almonte High School. Presented to the Legislature, April 28th, 1914. Mr. *Marshall*. *Not Printed*.
- No. 104    Return to an Order of the House of the 21st April, 1914, for a Return showing:—1. The present practice of the Department of Education in regard to the number of text-books authorized for use in each subject in the Course of Studies. 2. The number of text-books authorized for use in the elementary and secondary

schools of Ontario issued since the date of the last return laid before this House, March 20th, 1911, and the methods adopted to keep these books up to the requirements of the schools. 3. The cost to the Province of each of these books in the form of payments to authors, printers and electrotypers. 4. The estimated saving to purchasers of all text-books in elementary and secondary schools on all the books as compared with previous prices of the same. 5. The amount annually paid in royalties by the Department of Education to writers of authorized text-books. 6. The cost to the Province of the preparation, editing, and printing of supplementary readers authorized for use in the schools. 7. The amount paid annually by publishers to any official of the Department of Education on text-books authorized for use in the schools of this Province. 8. What Ontario books have been adopted in other Provinces. Presented to the Legislature, April 28th, 1914. Mr. Masgrove. Printed.



# REPORT

OF THE

## Minister of Lands, Forests and Mines

OF THE

### PROVINCE OF ONTARIO

For the Year Ending 31st October

1913

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PRINTED BY ORDER OF  
THE LEGISLATIVE ASSEMBLY OF ONTARIO

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TORONTO.

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1914

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# CONTENTS.

## Appendices:

	PAGE
No. 1. Statement of Officers and Clerks in the Department .....	2
2. " Crown Lands Agents and Homestead Inspectors .....	5
3. " Lands sold and Leased and Collections .....	7
4. " Gross Revenue .....	8
5. " Receipts Considered as Special Funds .....	9
6. " Gross Disbursements .....	10
7. " Expenditure on Account of Various Services .....	33
8. " Revenue from Woods and Forests .....	34
9. " Patents, etc., Issued .....	35
10. " Timber Cut and Amounts Accruing for Dues, etc. ....	36
11. " Work Done in Military Branch .....	38
12. " Letters Received and Mailed .....	38
13. " Locations, etc., under Free Grants Act .....	39
14. " Municipal Surveys Ordered .....	44
15. " Municipal Surveys Confirmed .....	45
16. " Crown Surveys in Progress .....	47
17. " Crown Surveys Completed .....	48
18. Surveyor's Report, base and meridian lines, District of Algoma and Thunder Bay .....	50
19. " Township Outlines, District of Algoma .....	53
20. " " " " .....	57
21. " " " " .....	59
22. " " " Sudbury .....	61
23. " Township of Henvey, District of Parry Sound ....	64
23a. " Piece of Land West of Mowat and South of the Hen- vey Inlet Indian Reserve .....	65
24. " Township of Mulloy, District of Algoma .....	66
25. " Southerly Eight Concessions, Township of Hanlan, District of Algoma .....	69
26. " Southern portion. Township of Casgrain, District of Algoma .....	70
27. " Township of Stoddart, District of Algoma .....	72
28. " Township of Studholme " .....	74
29. " Township of Shackleton, District of Temiscaming .	77
30. " Township of Sargeant, " .....	78
31. " Township of Fauquier, " .....	80
32. " Hay Bay, Township of Fredericksburg, County of Lennox and Addington .....	81
33. " Cache Lake, Township of Canisbay .....	84
34. " Dawson Road lots, District of Thunder Bay .....	86
35. " Parts of the Townships of Blake and Crooks, District of Thunder Bay .....	88
36. " Township of Mathieu, District of Rainy River ....	90
37. Report of Superintendent Algonquin Provincial Park .....	92
38. Report of Forestry Branch .....	95
39. Supplementary List of Licensed Cullers .....	102
40. Making Square Timber (Illustrations) .....	103
41. Report of J. F. Whitson on Construction of Roads in Northern Ontario..	118





# Report of the Minister of Lands, Forests and Mines of the Province of Ontario

For the Year ending 31st October, 1913

To His Honour THE HONOURABLE SIR JOHN MORISON GIBSON, K.C.M.G.,  
*Lieutenant-Governor of the Province of Ontario.*

MAY IT PLEASE YOUR HONOUR:

I have the honour to submit for the information of your Honour and the Legislative Assembly a report for the fiscal year ending 31st October, 1913, of the management of the Crown Lands of the Province.

## CLERGY LANDS.

The area sold during the year was 181 acres, the value of which was \$124.57. The collection on account of Clergy Lands was \$1,284.38. (See Appendix No. 3, page 7.)

## COMMON SCHOOL LANDS.

There were no sales. The collection on account of former sales was \$4,363.63. (See Appendix No. 3, page 7.)

## GRAMMAR SCHOOL LANDS.

The area sold during the year was 121 acres, for \$542.25. The collection on account of these and former sales was \$729.90. (See Appendix No. 3, page 7.)

## UNIVERSITY LANDS.

The area of these lands sold during the year was 10.484 acres for \$6,766.47. The collection on account of these and former sales was \$3,356.72. (See Appendix No. 3, page 7.)

## CROWN LANDS.

There was sold during the year for agricultural and town site areas 202,088 acres for \$151,840.93. The collection on account of these and former sales was \$118,134.60. There was sold for mining purposes 34,375 acres for \$89,161.28. There was collected on account of these and former sales \$95,068.94.

There was leased for mining purposes 9,313 acres for \$9,313.24. There was collected on account of these leases and those of former years \$20,878.43. There was leased of Crown Lands an area of 4,309 acres for \$1,908.14. There was collected on account of these and the leases of former years \$18,348.05.

The total area of Crown Lands disposed of by sale and lease during the year was 260,873 acres for a value of \$259,956.88. The total collection on account of the sales, leases, etc., was \$262,164.65. (See Appendix No. 3, page 7.)

The Temiskaming region, covering by that expression the country lying between Haileybury and Cochrane, has had a considerable influx of settlers during the past year.

In the New Liskeard agency 239 settlers purchased 32,083 acres of land. In the Englehart Agency 112 settlers purchased 17,246 acres of land. In the Matheson Agency 385 settlers purchased 58,317 acres of land. In the Cochrane Agency 285 settlers purchased 42,683 acres of land, and in the Hearst Agency, recently opened, 63 settlers purchased 8,224 acres of land. Altogether in that region 1,084 settlers purchased 158,553 acres of land. In other parts of the Province 137 settlers purchased 18,130 acres of land.

When the Transcontinental Railway is in regular operation, a time table established and reliable freightage at reasonable rates secured, people will move into that country in large numbers. At present the country is handicapped by uncertain communication and heavy charges. The progress of that country, too, particularly in the Clay Belt, will measurably depend upon the developments that take place there. The land, of course, is intended for actual settlers. The class of people who will probably go in there will not be men of large capital and will have to depend in the future on local markets for what they have to sell, whether it be agricultural products or timber, and also for employment during the winter season. The Abitibi Pulp and Paper Company is rapidly completing a development which will give good markets and employment to a large number of people. This company will have a probable output of 250 tons of news print per day. They intend erecting this summer 75 houses for their workmen, which will give them altogether from 200 to 250 houses. They have laid out their town site and are putting in sewers and a water system. It is expected that their mill will be running some time in June and ready to turn out pulp commercially by the 1st of July. They have taken out about 40,000 cords of pulpwood this winter and when they are in full running order will require 90,000 cords for their paper mill. It will be seen from this what an important industry they are creating, and it is obvious how such a development will assist in opening up that region.

The New Ontario Colonization Company is pressing forward their development by the building of roads and the erection of houses, and are, in other ways, making preparations to promote settlement on a considerable scale.

The Department has advertised for sale another pulp concession situated on the Metagami River on which development on a large scale is expected. Other developments of a similar character may be expected in the near future, and as soon as the Transcontinental is running and reasonable freights obtained, outside buyers of pulpwood will come in and widen out the market for settlers' timber.

The completion of the Algoma Central Railway to Hearst on the line of the Transcontinental will give a new outlet and inlet from Sault Ste. Marie and the large pulp mills at that place will be purchasers along the line of the Transcontinental of supplies for their mills.

The Department is preparing the way for settlement by the construction of roads which will enable settlers to get to their lands without delay or hardship. There exists in the Clay Belt a vast region of enormous possibilities waiting for proper facilities for travel to become densely settled with prosperous people. It would be folly to attempt to bring large numbers into that region before it was properly opened up by railway and markets and employment available. It is better to make haste slowly than to have any setback later on.

## FREE GRANTS.

Throughout the year practically 2,000 settlers located and purchased Free Grant lands to the extent of 240,000 acres, the greater areas having been taken up in the northern part of the Province. In the Districts of Thunder Bay and Rainy River along over 800 homesteaders were allotted lands; while in Dryden and Kenora Agencies nearly 200 took up Crown Lands subject to Free Grant regulations. In the older parts of the Province generally speaking there was a greater demand for Free Grant land, and the number of settlers exceeded the previous year by over 100. During the year 828 locatees completed their settlement duties and obtained their patents.

The only townships appropriated during the year ending 31st October, 1913, for Free Grant purposes were Henvey in the Parry Sound District and part of McClintock in the Provisional County of Haliburton.

## MILITARY GRANTS.

The total number of military certificates issued to date, under the Veterans Land Grant Act, 1 Edward VII., cap. 6, is 13998.

During the year there have been 146 certificates located, making in all a total of 8,017 located.

There were 9 certificates surrendered to the Crown for the \$50.00 commutation, this makes a total of 3,226 certificates surrendered.

In 34 cases the certificates have been surrendered and applied in payment of lands purchased from the Crown making a total of 702 that have been applied in this manner.

During the year there have been 844 patents issued for lands located by veterans making a total of 6,405 thus disposed of.

The total number, therefore, of certificates that have now been redeemed is 11,945 leaving 1,953 still outstanding.

The locatees of all lands granted under this Act, must apply for their patents for such land before ten years have expired from date of location. If this application for patent is not made within the ten years, then the land comes under the settlement regulations, and unless the settlement duties are proceeded with, the locations are liable to cancellation.

## THE MINERAL INDUSTRY.

The mineral production of Ontario in 1913 had a total value of \$53,207,311, the largest yet recorded in any year. Of this \$37,507,935 was of metallic, and \$15,699,376 of non-metallic substances. The increase over the output for 1912 was \$4,865,699, or more than 10 per cent.

## METALS.

*Gold.*—There were 16 producing gold mines in 1913, 7 of which were in Porcupine, and 9 elsewhere. The Porcupine mines yielded 207,583 ounces of gold, or more than 94 per cent. of the whole production. Hollinger crushed 138,291 tons of ore for a yield of 118,558 ounces, the average contents recovered per ton for the year being .857 oz. At the Dome 131,149 tons were treated and 59,912 ounces of gold obtained, the average recovery per ton being .456 ounce.



The mill at the Dome mine is being enlarged and its capacity increased from 40 to 80 stamps. The completed mill is expected to be in operation during the spring of 1914. There were 5 other producers at Porcupine, the principal of which were Porcupine Crown and McIntyre-Porcupine. In their combined operations they treated 53,705 tons of ore, which turned out 29,093 ounces of gold, or an average yield per ton of .541 oz.

From the other gold districts, the production was as follows: Kirkland Lake and Swastika, 4,183 ounces, Long Lake, 5,879 ounces, Larder Lake, 700 ounces, Eastern Ontario, 1,065 ounces, and Northwestern Ontario, 1,262 ounces.

Much attention is being given to Kirkland Lake, where is situated the Tough-Oakes mine. From this property 101,049 tons of selected ore were shipped, which contained a gross value of \$46,685 or \$162 per ton. In addition 1,975 tons of lower grade material were put through a small stamp mill and \$26,232.31 in gold recovered, or \$13.28 per ton.

*Silver.*—The production at Cobalt was a little less than in 1912, being 29,681,975 fine ounces as against 30,243,859—a decrease of 561,884 ounces, or 1.85 per cent. High-water mark in this camp was apparently reached in 1911, when the yield was 31,507,791 ounces. The process of decline is proving more gradual than did that of increase, the falling-off in two years being only 5.7 per cent. The price of silver last year was lower than in 1912, the average in New York for the twelve months being 59.791 cents per fine ounce as compared with 60.835 cents. The result was to reduce the return to the mining companies by \$853,934, the value of the output being \$16,555,001.

To obtain the total yield of silver, there should be added to the Cobalt output 42,956 ounces recovered from the auriferous ores of Porcupine and the other gold camps.

It is now ten years since the silver deposits of Cobalt began to be worked, and up to the end of 1913, their total yield had a value of over 98 millions of dollars, the record in detail being as follows:—

Year	Ounces	Value
		\$
1904.....	206,875	111,887
1905.....	2,451,356	1,360,503
1906.....	5,401,766	3,667,551
1907.....	10,023,311	6,155,391
1908.....	19,437,875	9,133,378
1909.....	25,897,825	12,461,576
1910.....	30,645,181	15,478,047
1911.....	31,507,791	15,953,847
1912.....	30,243,859	17,408,935
1913.....	29,681,975	16,555,001
	185,497,814	98,286,116

The life of the camp is being prolonged by the discovery of new veins, by the drainage of lakes so as to permit a more complete recovery of the deposits underlying them, and by an increasingly extensive concentration of low grade ore. Important veins were found last year when Kerr Lake was drained, and a promising find was made in February, 1914, on the old Kerry lease in the bed of Peterson Lake; the drainage of Cobalt Lake is about to be begun; and a new 80-stamp concentration plant has been built to take the place of the Northern



Custom plant sold to an English syndicate which has taken over the Cobalt Town-site and other mines.

Of the whole production of silver, 28,105,505 ounces came from the mines of Cobalt proper, the yield from the outlying camps being as follows:

	oz.	oz.
Gowganda:—		
Miller-Lake O'Brien.....	469,923	
Mann.....	32,447	
		502,370
South Lorrain:—		
Wettlaufer-Lorrain .....		248,992
Casey:—		
Casey Cobalt.....		825,108
Total.....		1,576,470

*Nickel.*—The quantity of ore smelted at the nickel-copper works in 1913, was 823,403 tons, which produced 47,150 tons of bessemerized matte. The nickel contents amounted to 24,838 tons, valued in the matte at \$5,237,477. In 1912, the production was 22,421 tons worth \$4,722,040, the increase being therefore a little under 11 per cent.

The operating companies are the Canadian Copper Company, and the Mond Nickel Company. Of the ore treated by the former, 418,525 tons were taken from the Creighton mine, 54,646 from Crean Hill, 56,439 from No. 2, and 86,665 from No. 3. The last mentioned mine is also known as the Frood. The Mond Company's ore was derived as follows: from the Garson mine, 113,403 tons, from Victoria No. 1, 38,592 tons, from North Star, 11,294 tons, and from Worthington, 537 tons. This company also received and smelted 4,596 tons of ore from the Alexo mine in the township of Dundonald, on the line of the T. & N. O. railway, the product of which is similar in character to that of the Sudbury mines. The Mond company during the year removed their smelting plant from Victoria Mines to Coniston, some eight miles east of Sudbury, where they have erected a complete and well-equipped plant. The British America Nickel Corporation have acquired the holdings of the old Dominion Nickel-Copper Company, and are developing the Murray and Whistle mines. They raised no ore during the year.

The satisfactory results obtained by diamond drilling at the Murray, Frood, Garson, Leveck and other properties, disclosing as they have, immense reserves of ore, have established nickel mining in Ontario on an assured basis.

*Copper.*—The mattes produced at the Sudbury nickel-copper smelters furnished the only copper obtained in 1913, save for about 3 tons which accompanied some concentrates shipped from the Temiskaming silver mine, Cobalt. The quantity was 12,941 tons, valued in the matte at \$1,840,492. This compares with 11,126 tons in 1912, worth \$1,584,310, an increase of about 16 per cent. The percentage of the copper to the nickel in the Sudbury mattes last year was a little over 1 to 2.

*Iron Ore and Pig Iron.*—There were shipped from the iron mines of the Province last year 195,937 tons valued at \$424,072. Of this quantity 165,454 tons were of ore as taken from the mine, the remaining 30,483 tons were composed of 22,327 tons of roasted siderite from the Magpie mine, 4,841 tons of concentrates from the Trenton plant of the Canada Iron Mines, and 3,315 tons of briquettes from the Gröndal magnetic concentrating works at Moose Mountain. The latter mine, it is stated, will be in a position to ship 200,000 tons to the United States market in 1914. At the Magpie mine the Algoma Steel Corporation are enlarging

the capacity of the roasting plant which was erected to treat the siderite ore of which that deposit is composed.

The output of pig iron continues to grow, the product of the furnaces being 648,899 tons in 1913, worth \$8,719,892, as against 589,593 tons in 1912, valued at \$8,054,369—an increase of 10 per cent. in quantity and 8 per cent. in value. There are now eleven blast furnaces in the Province; of these only one, that of the Atikokan Iron Company at Port Arthur, was not in operation in 1913. During the year two new furnaces were blown in—one by the Canadian Furnace Company, Port Colborne, and the other by the Standard Iron Company at Parry Sound. The last named uses charcoal as fuel.

#### NON-METALS.

The output of non-metallic products showed a gain over 1912 of over 25 per cent.

The increase was general throughout the list. Out of 24 products, four showed a decrease aggregating \$162,163, while the remaining 20 increased by \$2,319,679.

The largest falling off was in corundum, \$96,176; quartz receded by \$48,716, arsenic by \$15,151, and mica by \$2,120.

On the other hand, Portland cement advanced by \$739,805, pressed brick by \$237,122, stone by \$183,314, natural gas by \$68,999, sewer pipe by \$135,670, common brick by \$274,102, iron pyrites by \$100,644, etc. Three of the Canada Cement Company's plants were shut down about the beginning of 1914, and will not likely be opened again this year.

Sand and gravel, of which statistics were collected for the first time, show a production valued at \$233,567.

It is noteworthy that although the output of petroleum continues to decline—the reduction in 1913 as compared with 1912 being 516,969 gallons—the value was greater by \$53,514.

Construction materials, as a whole, including brick of all kinds, lime, stone and cement, had an increased production of \$1,512,845, or 7.3 per cent., as follows:

Product	1912	1913
	\$	\$
Bricks.....	4,034,405	4,615,212
Lime.....	381,672	390,600
Stone.....	953,839	1,137,153
Cement.....	3,365,659	4,105,455
Total.....	8,735,575	10,248,420

#### NOTES.

*Water Power.*—The mines and metallurgical plants of northern Ontario are now for the most part operated by electricity generated by water powers. This is true of Cobalt, where falls and rapids on the Montreal and Matabitchewan rivers are utilized; of Sudbury, where the mines and smelters are supplied with power by the Spanish, Wahnapiatae and Vermilion rivers; of Porcupine, to which power is conducted from the Mattagami; of Michipicoten, where the Michipicoten and Mag-

pie hoist the ore and operate the machinery at the Helen and Magpie mines; of the Canadian Exploration Company's gold mine at Long Lake, and of others. A new water power installation is being put in at Gowganda Lake to operate the Miller-Lake O'Brien silver mine, and a transmission line is under construction from the Blanche river at Charlton to work the gold properties in the new field at Kirkland lake. Water powers are numerous in northern Ontario, and, as at Iroquois Falls on the Abitibi river, are employed also to operate pulp and paper mills. They have been of great service to the mining industry in providing cheap power.

#### COLLECTIONS.

The total revenue of the Department from all sources was \$2,793,809.87. Of this \$118,134.60 came from agricultural and town sites; mining lands \$95,068.94; mining and crown leases \$39,226.48; miners' licenses, permits and recording fees \$93,256.10; royalties \$200,333.01; supplementary revenue tax \$211,063.84. From woods and forests the revenue was \$1,979,125.81, made up of the following items, bonus \$591,675.29; timber dues \$1,377,490.08; ground rent \$99,460.19; transfer fees \$10,500.25. (See Appendix No. 4, page 8.)

#### DISBURSEMENTS.

The total expenditure of the Department for ordinary services was \$696,051.63. Some of the principal items were: Agents' salaries and disbursements \$15,812.69; homestead inspectors \$11,121.96; Crown timber agents \$30,537.69; wood ranging and estimation of timber \$94,697.40; fire ranging \$145,500.81; forest reserves, fire ranging, etc., Temagami reserve \$46,326.93, Metagami reserve \$8,882.88, Mississauga reserve \$12,680.63, Nipigon reserve \$12,264.73, Eastern reserve \$2,941.56, Quetico reserve \$4,077.00; mines and mining \$37,553.94; mining recorders \$26,304.75; surveys \$89,123.51; refunds \$13,986.24; contingencies, lands and forests \$20,375.89, bureau of mines \$12,258.13.

There was expended under the direction of the Department the sum of \$1,120,471.60. Of this amount, \$1,081,172.28 was in connection with the northern development, under 2 Geo. V, while the other principal items were, Algonquin Park \$21,554.09, exploration party in new territory, \$2,932.64, and expenditure under Bounty Act 7 Edward VII., cap. 14, \$14,362.59. (See Appendix Nos. 6 and 7, pages 10 to 33.)

#### WOODS AND FORESTS.

The total revenue accrued for the year ending the 31st of October, 1913, from woods and forests was \$2,127,222.56—an increase of \$59,162 over last year. The revenue collected during the year from the same source amounted to \$1,979,125.81, which is only about \$6,000 less than the collection of last year; and last year was somewhat of a record year, as the revenue collected exceeded that of the previous year by \$274,000. The revenue derived from timber dues was \$1,377,490.08 as against the collection of \$1,339,957.12 for last year. The collection on account of bonus was \$591,676.29 as against the collection of \$540,702.85 for last year. The collection on account of ground rent was \$99,460.19 as against \$96,262 for last year. The collection on account to transfer bonus was \$10,500 as against \$8,740 for last year.

The area under timber license for the season of 1913 was 17,519½ miles as against 18,410 miles for last year. The area under license fluctuates from year to



year for the following reasons: Areas are cut out and surrendered by the licensees and there are other areas on which the ground rent is not paid and the license does not issue. There was surrendered this year 257 miles and new licenses were issued for areas sold during the year amounting to about 100 miles. The output of pine sawlogs, booms and square timber in feet board measure was 360,377,168 feet board measure, which is 127,661,498 feet board measure below the output of last year. The output of timber other than pine was 64,497,036 feet board measure as against 69,373,572 feet board measure for last year. The quantity of pulpwood taken out from Crown Lands was 131,431 cords as against 140,338 cords for last year. There were 6,355,828 pieces of railway ties taken out this year as against 5,704,559 for last year, or an increase of 651,269 ties over the output for last year. It will be seen that, as was expected, the output of all kinds of timber was considerably below the output of last year, except railway ties. The great scarcity of money compelled a number of lumbermen to shorten up their operations, while others did not operate at all. It is not expected that there will be much increase in the cutting of the present winter as the financial stringency has not entirely ceased.

During the year the pine timber in the Townships of Thistle and McWilliams tributary to Lake Nipissing was offered for sale by public tender. The Department had careful examinations made of the Townships which showed that a large percentage of the timber in them was mature and that the large timber was very faulty. There was a request from the Ontario Pulp Company to be allowed to get a part of its supply in these townships, and there was the danger of fire owing to the construction of the Canadian Northern Railway in the neighborhood. Under these circumstances it was considered advisable to offer the timber for sale, and it was accordingly sold, subject to an increase in ground rent from \$5 to \$10 per mile, and an increase in the timber dues from \$2 per thousand to \$5 per thousand, and the important condition was put in that no trees of a less diameter than 12 inches on the stump 2 feet from the ground should be cut. The increase of the ground rent and timber dues was a substantial one and the conditions prohibiting the cutting of small trees were new. The amount realized from the sale was \$147,500 or an average per acre of about \$3 with \$5 per thousand to be paid when the timber is cut.

#### FIRERANGING.

The fireranging service during the summer was composed of 217 rangers in forest reserves, 208 on railways, and 114 on lands of the Crown. There were 34 chief rangers including the services of the Crown Timber Agents: 4 assistant chief rangers, and 8 supervising rangers on licensed lands, making a total of 585 men. The timber licensees had on their various limits 350 rangers, so that the total staff of firerangers on duty last year was 935 men. There were no serious fires during the past season on lands of the Crown except in the Township of Dana, and there the timber damaged was disposed of and will be cut this winter. On licensed territory the Georgian Bay Lumber Company had some timber burnt by locomotives of the Canadian Pacific Railway, and on the Booth limits tributary to the Mattawa River some timber was damaged in the course of railway construction. These are the only fires of any consequence which occurred on lands of the Crown or licensed territory during the present year.



## FOREST RESERVES.

The Temagami Forest Reserve had a staff of 137 firerangers under 4 chiefs. The area of this reserve is about 6,000 miles. There being a large quantity of timber in the reserve it is necessary that it should be very closely guarded. There have been no fires in the reserve during the past year.

The Mississaga Reserve contains an area of about 3,000 miles. There is a large quantity of first-class pine in this Reserve. There has been a staff of 32 rangers in this Reserve during the past summer under a chief ranger. The territory has been efficiently patrolled and no fires have occurred.

The Nepigon Reserve is the largest Reserve in the Province, having an area of 7,300 miles. It is not a pine country but there are large quantities of pulpwood in it. Two railways are being built through it and it is a popular fishing resort. It therefore requires to be closely ranged. We had 20 rangers on duty in this Reserve in addition to those on railway construction where railways are being built through it.

The Quetico Reserve is situated in the Rainy River District lying along the boundary line between Canada and the United States. It contains an area of 1,500 miles and there is a large quantity of pine in it. It is away from settlement and is therefore not in so much danger from fire. There were 14 firerangers in this Reserve last year in charge of Mr. Crown Timber Agent Watts. No fires occurred. The changing of this Reserve into a park so as to give better protection to the game is under consideration.

The Eastern Reserve is situated in the County of Addington and has an area of 100 square miles. The timber in this Reserve is stated to be growing up very rapidly. There were no fires in it during the past year and it was protected by a chief ranger with 6 rangers under him.

What is called the Sibley Reserve contains an area of 70 miles and it covers the promontory called Thunder Cape at the entrance of Thunder Bay. No fires have occurred in this Reserve.

The Algonquin National Park has an area of 2,741 miles. Ten firerangers in addition to the ordinary park rangers were on duty there during last summer. Owing to the construction of the Canadian Northern Railway through the Park it became necessary to give it better protection.

Rondeau Park. This Park was formerly administered by this Department, but by Order in Council of May, 1913, it was transferred to the Public Works Department, and it is now controlled by that Department.

## RAILWAYS.

Full staffs of rangers have been on duty on the different railways. On the Temiskaming and Northern Ontario Railway there have been 58 rangers on duty under 3 superintendents: on the Transcontinental Railway 64 rangers under 3 chiefs; on the Canadian Northern 86 rangers under 5 chiefs, and on the Algoma Central Railway 26 rangers under 2 chiefs.

No serious fires occurred along any of the railways except as before stated in the Township of Wood on the Canadian Pacific Railway and along the construction of the Canadian Northern in the Township of Dana and on the Booth limits tributary to the Mattawa River.

The expenditure on fireranging for the past year has been as follows:

On Crown Lands .....	\$65,000.00
On Railways . . . . .	80,000.00
On Forest Reserves .....	88,000.00

#### CULLERS' EXAMINATIONS.

Cullers' examinations were held at North Bay and Kenora. Fifteen candidates were successful at these examinations and were granted certificates authorizing them to act as cullers.

(For list of cullers who passed at the above examinations see Appendix 39 page (102).)

(For complete list of licensed cullers see Minister's reports for 1911 and 1912.)

#### CROWN SURVEYS.

The following Crown Surveys have been undertaken this year:

Instructions were given for the subdivision of the following townships:

Township of Lowther, in the District of Algoma.

Township of Scholfield, in the District of Algoma.

Township of Caithness, in the District of Algoma.

Township of Talbott, in the District of Algoma.

Township of Orkney, in the District of Algoma.

Township of Shetland, in the District of Algoma.

Township of Ebbs, in the District of Algoma.

Township of Sterling, in the District of Thunder Bay.

Township of O'Brien, in the District of Timiskaming.

Township of Malachi, in the District of Kenora.

Also outlines of townships in the District of Sudbury.

Outlines of townships in the District of Kenora.

Outlines of townships in the District of Kenora.

Timber Berths in the District of Kenora.

Timber Berths in the District of Kenora.

Certain lands adjoining the townships of MacGregor, Gorham and Ware, District of Thunder Bay.

Survey of Cache Lake, township of Canisbay, in the Algonquin National Park.

Inspection of surveys.

The report of the surveyors, so far as received and examined, will be found in appendices 18 to 36 inclusive, pages 50 to 91 inclusive.

#### MUNICIPAL SURVEYS.

On the petition of the Municipal Council of the township of Hinchinbrooke, instructions were issued to survey the line between concessions 7 and 8 from lots 9 to 13, in the township of Hinchinbrooke, or as much farther on each side as an original post can be found.

Also on a petition of the Municipal Council of the township of Toronto, instructions were issued to survey the allowance for road between the 1st and 2nd ranges, Credit Indian Reserve, south of Dundas Street, township of Toronto, from the north-west angle of lot No. 8, 1st range, across lots Nos. 9, 10, 11, 12, 13 and 14 in the 1st range, and lots Nos. 6, 9 and 10 in the 2nd range, Credit Indian

Reserve, and thence along the road allowance between the 2nd range, Credit Indian Reserve, and the 2nd Concession of Toronto Township south of Dundas Street, being across part of lot 22, lot 23, lot 24 and lot 25 in the 2nd concession south of Dundas Street, to the westerly limit of said lot 25, being the easterly limit of the allowance for road between lots Nos. 25 and 26, known as the "Lorne Park Road" and as regards the 2nd range on the northerly side of said road allowance being across parts of lots numbers 10, 11 and 12 and part of lot 13 in the 2nd range, Credit Indian Reserve, and to define said allowance for road by permanent stone or iron monuments planted on each side thereof.

The following municipal surveys have been confirmed under the provisions of the revised Statutes of Ontario, 1897, Chapter 181, Sections 14 and 15, such surveys being final and conclusive.

To survey certain concessions, road allowances, etc., formerly in the township of Barton, now in the city of Hamilton as follows: Barton Street from Sherman Ave. to the allowance for road between lots Nos. 2 and 3 of the township of Barton now in the City of Hamilton. Main Street from Sherman Ave. to Ottawa Street. The allowance for road between the 3rd and 4th concessions of Barton now in the city of Hamilton from Ottawa Street westerly to the city limits. Sherman Ave. from the brow of the mountain northerly to the base line. Trolley Street from the brow of the mountain northerly to Burlington Bay. Ottawa Street from the brow of the mountain northerly to Burlington Bay. Allowance for road between lots 2 and 3 from the City of Hamilton water works pipe line to Barton St. and to plant durable monuments at the front and rear of the said portions of the concessions and allowances for road between lots in the city of Hamilton, and at the front and rear angles of the lots therein, also to plant durable monuments at the front and rear of the following portions of concessions and allowances for road between lots in the city of Hamilton, and at the front and rear angles of the lots therein—from the eastern limit of Lakeview Ave. to the head of the Strongman Mountain Road. From Bay Street to allowance for road between lots 20 and 21 known as Paradise Road. Paradise Road from Aberdeen Ave. to Marsh known as Coots Paradise.

Also to survey the line between concessions 7 and 8 from lots 9 to 13, in the township of Hinchinbrooke, or as much farther on each side as an original post can be found.

Also to survey the boundary line between the townships of Montague and Beckwith, in the County of Lanark, and to plant stone and other durable monuments on each side of the road allowance in such positions as shall define the true boundary between the said townships.

Particulars relating to these surveys will be found in Appendices 14 and 15, pages 44 and 45.

W. H. HEARST,

Minister.

Department of Lands, Forests and Mines,  
Toronto, October 31st, 1913.





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# APPENDICES

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## Appendix No. 1.

Return of Officers and Clerks of the Department of Lands, Forests and Mines for the year ending October 31st, 1913.

Branch.	Name.	Designation.	When appointed.	Salary per annum.	Remarks.
	Hon. W. H. Hearst	Minister	1911, Oct. 12	\$ 6,000 00	
	Aubrey White	Deputy Minister	1882, Jan. 1	4,200 00	
	Geo. Kennedy	Law Clerk	1872, Feb. 1	2,800 00	
	C. C. Hele	Minister's Secretary	1912, Jan. 23	1,700 00	
	E. S. Williamson	Secretary to Department	1889, May 1	1,900 00	
	Janet Garvie	Clerk	1905, Jan. 1	800 00	
	James Farrington	Stenographer	1910, Dec. 14	700 00	
Sales and Free Grants	J. J. Murphy	Chief Clerk	1872, May 1	2,250 00	
	Walter C. Cain	Clerk	1903, March 6	1,650 00	
	W. R. Ledger	do	1894, Feb. 5	1,350 00	
	Selby Draper	do	1903, Jan. 1	1,300 00	
	S. A. Platt	do	1907, March 13	1,100 00	
	F. Lucas	do	1909, March 24	1,050 00	
	F. Samuels	do	1909, March 24	875 00	
	W. B. Baines	do	1912, Oct. 5	850 00	
	May Bengough	Stenographer	1896, Oct. 23	725 00	
	Jean C. Oram	do	1907, Jan. 16	700 00	
	Nan McQueen	do	1909, March 24	700 00	
	H. E. Johnston	Chief Clerk	1907, March 13	1,500 00	
	E. F. O'Neil	Stenographer	1904, Nov. 9	700 00	
Military Grants.	G. B. Kirkpatrick	Director of Surveys	1866, Jan. 30	2,700 00	
	L. V. Rorke	Surveyor and Draughtsman	1909, May 1	2,500 00	
	James Hutcheon	Asst Surveyor & Draughtsm'n	1913, May 20	2,100 00	
	W. F. Lewis	Clerk	1872, May 5	1,350 00	
	D. G. Boyd	Draughtsman	1897, Sept. 27	1,350 00	
	E. M. Jarvis	Clerk	1904, Oct. 19	1,300 00	
	J. B. Proctor	do	1897, Jan. 15	1,150 00	
	H. Treeby	Draughtsman	1904, Jan. 13	1,200 00	
	John Work	do	1911, March 3	1,150 00	
	F. E. Blanchet	do	1907, March 13	1,050 00	
	A. Leaman	do	1909, March 24	1,050 00	
	B. Rushford	do	1912, Oct. 5	1,000 00	
Surveys					

Patents .....	M. H. Kirkland .....	Stenographer .....	1904, Nov. 23 .....	700 00
	E. G. Halliday .....	do .....	1909, March 24 .....	700 00
	E. C. Armer .....	do .....	1911, March 3 .....	600 00
	B. Benson .....	do .....	1911, March 3 .....	600 00
Patents .....	C. O'Connor .....	do .....	1911, March 3 .....	600 00
	C. S. Jones .....	Chief Clerk .....	1890, May 22 .....	2,000 00
	C. E. Burns .....	Clerk.....	1900, April 9 .....	1,400 00
	W. S. Sutherland .....	do .....	1902, Jan. 13 .....	1,300 00
Woods and Forests.....	W. Carrell .....	do .....	1904, Jan. 15 .....	1,200 00
	A. E. Robillard .....	do .....	1894, May 8 .....	1,000 00
	A. E. Roe .....	do .....	1909, March 24 .....	1,150 00
	J. A. G. Crozier .....	Chief Clerk .....	1867, Dec. 1 .....	2,250 00
Woods and Forests.....	J. B. Cook .....	Clerk .....	1898, Aug. 1 .....	1,650 00
	H. Gillard .....	do .....	1900, April 9 .....	1,450 00
	F. J. Niven .....	do .....	1903, March 6 .....	1,250 00
	W. F. Trivett .....	do .....	1904, Jan. 13 .....	1,200 00
Woods and Forests.....	R. H. Hodgson .....	do .....	1904, Nov. 23 .....	1,150 00
	J. Houser .....	do .....	1907, March 13 .....	1,250 00
	A. H. O'Neil .....	do .....	1909, March 24 .....	950 00
	G. W. Harris .....	do .....	1909, March 24 .....	950 00
Woods and Forests.....	N. L. Rogers .....	do .....	1911, Nov. 1 .....	900 00
	S. D. Meeking .....	do .....	1910, June 1 .....	850 00
	A. P. Saunders .....	do .....	1913, April 30 .....	800 00
	Amy Thompson .....	Stenographer .....	1909, March 24 .....	750 00
Accounts.....	M. E. Bliss .....	do .....	1909, Sept. 1 .....	650 00
	D. G. Ross .....	Accountant .....	1861, April 15 .....	2,450 00
	H. M. Lount .....	Clerk .....	1904, Jan. 13 .....	1,500 00
	C. J. Clarke .....	do .....	1907, March 13 .....	1,100 00
Accounts.....	R. Gordon .....	do .....	1913, April 30 .....	800 00
	C. Bowland .....	Clerk and Stenographer .....	1911, March 3 .....	675 00
	Frank Veigh .....	Registrar .....	1880, March 1 .....	1,550 00
	Chester Dies .....	Clerk .....	1907, March 13 .....	1,150 00
Forestry .....	E. J. Zavitz .....	Director .....	1912, Nov. 7 .....	2,500 00
	F. S. Newman .....	Assistant Director .....	1913, Sept. 22 .....	1,600 00
Bureau of Mines	Thos. W. Gibson .....	Deputy Minister .....	1891, June 19 .....	3,800 00
	R. D. Fisher .....	Secretary .....	1907, March 13 .....	1,250 00
	W. H. Morris .....	Clerk .....	1906, Jan. 1 .....	1,100 00

## Appendix No. 1.—(Concluded).

Return of Officers and Clerks of the Department of Lands, Forests and Mines for the year ending October 31st, 1913.

Branch	Name.	Designation.	When appointed.	Salary per annum.	Remarks.
Bureau of Mines	W. Lemoine	Clerk	1908, April 8	\$ 1,100 00	
	A. Burritt	do	1908, April 8	1,100 00	
	D. H. Barr	do	1907, March 13	1,100 00	
	Anne Moffatt	do	1901, March 1	1,050 00	
	A. G. Scovell	do	1909, March 24	1,000 00	
	W. St. John	do	1910, April 14	950 00	
	Ethel Craig	Clerk and Stenographer	1906, May 16	745 00	
	Flossie McDougall	do	1907, March 13	700 00	
	J. L. McNaughton	Stenographer	1909, March 24	725 00	
	H. W. Batchelor	do	1911, Dec. 19	600 00	
	H. Brophy	Messenger	1898, Oct. 1	875 00	

D GEO. ROSS,

Accountant.

AUBREY WHITE,

Deputy Minister of Lands and Forests.



## Appendix No. 2.

List of Land Agents and Homestead Inspectors for the year ending October 31st, 1913.

Name.	Post office address.	District or county.	Date of appointment.	Salary per annum.	Remarks.
Anderson, T. V. ....	Hearst .....	Part of District of Algoma .....	1913, May 9 ..	\$ 500 00	
Baker, R. H. ....	Minden .....	Part of Victoria .....	1907, Oct. 1 ..	350 00	
Barr, Jas. ....	Fort Frances .....	Homestead Inspector .....	1906, Nov. 23 ..	1,200 00	
Bastien, J. A. ....	Chelmsford .....	do .....	1913, May 2 ..	600 00	
Bolger, J. W. ....	New Liskeard ..	Lake Temiskaming, District of Nipissing ..	1913, July 17 ..	500 00	
Both, Chas. ....	Denbigh .....	Part of Frontenac and Addington .....	1905, Oct. 20 ..	100 00	
Brown, J. B. ....	Bracebridge .....	Homestead Inspector and Crown Land Agent	1905, July 28 ..	900 00	
Byers, R. J. ....	Massey .....	Part District of Sudbury .....	1905, July 3 ..	500 00	
Buchanan, T. ....	Thessalon .....	do do .....	1901, Nov 30 ..	300 00	
Burrows, W. A. ....	Port Arthur .....	do do Thunder Bay .....	1912, Jan. 30 ..	600 00	
Burnes, C. W. ....	Sundridge .....	Homestead Inspector .....	1905, Nov. 15 ..	900 00	
Cameron, Wm. ....	Stratton Sta. ....	Part of District of Rainy River .....	1911, April 27 ..	500 00	
Chester, T. ....	New Liskeard ..	Homestead Inspector .....	1906, June 8 ..	1,200 00	Resigned March 31st, 1913.
Cragg, W. V. ....	New Liskeard ..	do .....	1913, March 27 ..	1,200 00	
Dean, Thos. ....	Sault Ste. Marie. ....	do .....	1908, July 29 ..	600 00	
Dempsey, S. J. ....	Greenview .....	Part of District of Nipissing .....	1911, Feb. 1 ..	600 00	
Douglas, W. J. ....	Powassan .....	do Hastings .....	1912, June 1 ..	500 00	
Ellis, H. J. ....	Magnetawan .....	do District of Parry Sound .....	1909, May 20 ..	500 00	
Freeborn, Dr. J. S. ....	Matheson .....	do do Nipissing .....	1905, Nov. 10 ..	500 00	
Ginn, F. E. ....	New Liskeard ..	Lake Temiskaming, District of Nipissing ..	1912, March 20 ..	600 00	
Grills, J. J. ....	Chelmsford .....	Homestead Inspector .....	1905, July 3 ..	500 00	Resigned July 31st, 1913.
Groulx, R. J. ....	Apsley .....	Part County of Peterboro .....	1906, May 7 ..	600 00	Resigned April 30th, 1913
Hales, W. ....	Fort Frances .....	Part Township of Alberta and part of District of Rainy River .....	1911, July 17 ..	250 00	
Hollands, C. J. ....		Homestead Inspector .....	1892, Oct. 12 ..	300 00	
Hughes, Thos. ....	Murillo .....	Part of District of Parry Sound .....	1908, July 20 ..	800 00	
Jenkin, Wm. ....	Emsdale .....	do do Sudbury .....	1908, July 29 ..	500 00	
Langlois, E. ....	Warren .....	do do .....	1911, April 4 ..	500 00	
Lenieux, J. A. ....	Bleazard Valley ..	do do .....	1908, July 1 ..	400 00	
MacLennan, J. K. ....	Sudbury .....	do do .....	1905, July 3 ..	500 00	
McFayden, A. ....	Emo .....	do do Rainy River .....	1905, Sept. 8 ..	500 00	

## Appendix No. 2.—Concluded.

List of Land Agents and Homestead Inspectors for the year ending October 31st, 1913.—Continued.

Name.	Post office address.	District or county.	Date of appointment.	Salary per annum.	Remarks.
Mulvaney, N. ....	Espanola Sta. ....	Part of District of Algoma .....	1912, June 1.	\$ 100 00	
Noble, E. ....	Sault Ste. Marie.	do do .....	1912, June 6.	300 00	
Parsons, W. J. ....	North Bay .....	do do Nipissing .....	1908, April 8.	500 00	
Phillion, J. A. ....	Sturgeon Falls ..	do do .....	1907, Sept. 13.	500 00	
Powell, F. R. ....	Parry Sound .....	do do Parry Sound .....	1907, May 31.	500 00	
Prince, A. ....	Wilno .....	do Renfrew .....	1905, July 12.	500 00	
Pronger, R. H. ....	Dryden .....	District of Rainy River .....	1906, May 7.	500 00	
Quenneville, I. ....	Sturgeon Falls ..	Homestead Inspector .....	1906, May 7.	600 00	
Rothwell, B. J. ....	Sault Ste. Marie.	Part District of Algoma .....	1909, March 1.	300 00	Resigned Jan. 31st, 1913.
Small, Robt. ....	Mattawa .....	do do Nipissing .....	1910, June 30.	500 00	
Smith, Dalton .....	Cochrane .....	Homestead Inspector .....	1912, April 16.	1,000 00	
Spry, W. L. ....	Kenora .....	Part District of Rainy River .....	1909, Sept. 21.	400 00	Also Mining Recorder.
Warren, D. B. ....	Pembroke .....	do Renfrew .....	1905, July 3.	300 00	Died April 14th, 1913.
Watson, T. P. ....	New Liskeard .....	Homestead Inspector .....	1905, May 10.	1,000 00	
Watt, F. ....	Pembroke .....	Part of Renfrew .....	1913, May 28.	300 00	
Wilson, James .....	Kinmount .....	do Peterboro .....	1907, Oct. 31.	175 00	
Whybourne, W. E. ....	Marksville .....	do St. Joseph Island .....	1905, April 7.	250 00	
Woollings, J. ....	Englehart .....	do District of Nipissing .....	1908, June 30.	600 00	

AUBREY WHITE,

Deputy Minister of Lands and Forests.

D. GEO. ROSS

Accountant.

*Appendix No. 3.*

Statement of Lands Sold and Leased. Amount of Sales and Leases and Amount of Collections for the year ending October 31st, 1913.

Service.	Acres sold and leased.	Amount of sales and leases.	Collection on sales and leases.
		\$ c.	\$ c.
<i>Lands Sold:</i>			
Agricultural and Townsites.....	202,088.03	151,840 93	118,134 60
Mining .....	34,375	89,161 28	95,068 94
Clergy.....	181.81	424 57	1,284 38
Common School .....			4,363 63
Grammar School .....	121	542 25	729 90
University .....	10,484.86	6,766 47	3,356 72
<i>Lands Leased:</i>			
Mining .....	9,313.24	9,313 24	20,878 43
Crown .....	4,309.86	1,908 14	18,348 05
	260,873.80	\$259,956 88	\$262,164 65

D. G. CO. ROSS  
Accountant.

AUBREY WHITE.  
Deputy Minister Lands and Forests.

*Appendix No. 4.*

Statement of Revenue of the Department of Lands, Forests and Mines for the year ending October 31st, 1913.

Service.	\$ c.	\$ c.	\$ c.
<b>LAND COLLECTIONS.</b>			
<i>Crown Lands:</i>			
Agricultural .....	111,731 24		
Townsites .....	6,403 36	118,134 60	
		95,068 94	
Mining .....		213,203 54	
Clergy Lands .....	1,284 38		
Common School Lands .....	4,363 63		
Grammar School Lands .....	729 90		
University Lands .....	3,356 72	9,734 63	
<i>Rent:</i>			
Mining Leases .....	20,878 43		
Crown Leases .....	18,348 05	39,226 48	
Miners' Licenses .....	44,065 80		
Permits .....	995 00		
Recording Fees .....	48,195 30	93,256 10	
Royalties .....		200,333 01	
<i>Supplementary Revenue:</i>			
Acreage Tax .....	13,915 70		
Profit Tax .....	173,532 65		
Gas Tax .....	23,615 49	211,063 84	
			766,817 60
<b>WOODS AND FORESTS.</b>			
Bonus .....		591,675 29	
Timber Dues .....		1,277,490 08	
Ground Rent .....		99,460 19	
Transfer Fees .....		10,500 25	1,979,125 81
Provincial Assay Fees .....	404 75		
Casual Fees .....	754 88		
Cullers' Fees .....	169 00	1,328 63	
Algonquin Park .....	8,270 45		
Rondeau Park .....	1,196 83		
Forest Reserves .....	1,070 70	10,537 98	
			11,866 61
<b>REFUNDS.</b>			
Fire Ranging .....		26,501 35	
Wood Ranging .....		8,475 54	
Surveys .....		22 41	
Contingencies .....		26 05	
Agents' Salaries .....		494 60	
Mining Recorders .....		92 00	
Mines and Mining .....		387 90	
			35,999 85
			\$2,793,809 87

D. GEO. ROSS,  
Accountant.

AUBREY WHITE,  
Deputy Minister of Lands and Forests.



*Appendix No. 5.*

Statement of Receipts of the Department of Lands, Forests and Mines for the year ending October 31st, 1913, which are considered as Special Funds.

Service.	\$	c.	\$	c.
<i>Clergy Lands.</i>				
Principal. ....	718	19		
Interest.....	566	19		
			1,284	38
<i>Common School Lands.</i>				
Principal.....	1,303	50		
Interest....	3,060	13		
			4,363	63
<i>Grammar School Lands.</i>				
Principal.....	629	45		
Interest.....	100	45		
			729	90
<i>University Lands.</i>				
Principal. ....	3,040	58		
Interest.....	316	14		
			3,356	72
			\$9,734	63

D. GEO. ROSS,  
Accountant.

AUBREY WHITE,  
Deputy Minister of Lands and Forests.

*Appendix No. 6.*

Statement of Disbursements of the Department of Lands, Forests and Mines for the year ending October 31st, 1913.

Service. -	\$ c.	\$ c	\$ c.
<b>AGENTS' SALARIES AND DISBURSEMENTS.</b>			
<i>Land, \$15,812.69.</i>			
Anderson, T. V. ....	208 33		
Disbursements .....	46 17		
		254 50	
Baker, R. H. ....	350 00		
Disbursements .....	1 58		
		351 58	
Both, C. ....		100 00	
Bolger, J. W. ....	125 00		
Disbursements .....	24 00		
		149 00	
Brown, J. B. ....	900 00		
Disbursements .....	118 60		
do Inspecting lands in Parry Sound.....	50 00		
		1,068 60	
Buchanan, Thos. ....		300 00	
Burrows, W. A. ....	550 00		
Disbursements .....	89 50		
		639 50	
Byers, R. J. ....		500 00	
Cameron, W. ....	500 00		
Disbursements .....	35 50		
		535 50	
Dempsay, S. J. ....	550 00		
Disbursements .....	42 95		
		592 95	
Douglas, W. J. ....	500 00		
Disbursements .....	11 82		
		511 82	
Ellis, H. J. ....		500 00	
Freeborn, Dr. J. S. ....	500 00		
Disbursements .....	10 75		
		510 75	
Ginn, F. E. ....	550 00		
Disbursements .....	79 23		
		629 23	
Grills, J. J. ....	375 00		
Disbursements .....	56 60		
		431 60	
Hales, W. ....		250 00	
Hollands, C. J. ....		300 00	
Jenkin, Wm. ....	500 00		
Disbursements .....	7 38		
		507 38	
Langlois, E. ....		500 00	
Lemieux, J. A. ....		400 00	
Mulvaney, N. ....	100 00		
Disbursements .....	4 61		
		104 61	
Carried forward .....		9,137 02	

*Appendix No. 6.—Continued.*

Service.	\$ c.	\$ c.	\$ c.
<i>Brought forwardd</i> .....		9,137 02	
<b>AGENTS' SALARIES AND DISBURSEMENTS.—Continued.</b>			
<i>Land.—Concluded.</i>			
McFayden, A. ....	500 00		
Disbursements .....	57 32	557 32	
MacLennan, J. K. ....	500 00		
Disbursements .....	30 00	530 00	
Noble, E. ....		225 00	
Parsons, W. J. ....	500 00		
Disbursements .....	8 50	508 50	
Philion, J. A. ....	500 00		
Disbursements .....	13 97	513 97	
Powell, F. R. ....	500 00		
Disbursements .....	17 00	517 00	
Prince, Adam ....	500 00		
Disbursements .....	15 50	515 50	
Pronger, R. H. ....	500 00		
Disbursements .....	18 10	518 10	
Rothwell, B. J. ....		75 00	
Small, R. ....	500 00		
Disbursements .....	6 24	506 24	
Spry, W. L. ....	400 00		
Disbursements .....	482 90	882 90	
Warren, D. B. ....		150 00	
Watt, F. ....		118 90	
Whybourne, W. E. ....	250 00		
Disbursements .....	18 14	268 14	
Wilson, J. ....	162 50		
Disbursements .....	12 60	175 10	
Woollings, Jos. ....	550 00		
Disbursements .....	64 00	614 00	
<i>Homestead Inspectors, \$11,127.96.</i>			
Barr, J. ....	1,200 00		
Disbursements .....	725 20	1,925 20	
Bastien, J. A. ....	282 25		
Disbursements .....	113 45	395 70	
Burnes, C. W. ....	900 00		
Disbursements .....	427 65	1,327 65	
Chester, T. ....	500 00		
Disbursements .....	133 81	633 81	
<i>Carried forward</i> .....		20,095 05	

*Appendix No. 6.—Continued.*

Service.	\$ c.	\$ c.	\$ c.
<i>Brought forward</i> .....		20,095 05	
<i>AGENTS' SALARIES AND DISBURSEMENTS.—Continued.</i>			
<i>Homestead Inspectors.—Concluded.</i>			
Cragg, W. V. ....	700 00		
Disbursements .....	307 99	1,007 99	
Dean, T. ....	600 00		
Disbursements .....	34 20	634 20	
Groulx, R. J. ....	317 75		
Disbursements .....	133 45	451 20	
Hughes, T. ....	800 00		
Disbursements .....	391 80	1,191 80	
Quenneville, I. ....	600 00		
Disbursements .....	150 15	750 15	
Smith, D. ....	900 00		
Disbursements .....	410 55	1,310 55	
Watson, T. P. ....	946 66		
Disbursements .....	553 05	1,499 71	
<i>Timber, \$30,537.69.</i>			
Bremner, Geo. ....	500 00		
Disbursements .....	135 45	635 45	
Christie, W. P. ....	1,600 00		
Disbursements .....	455 80	2,055 80	
Hawkins, S. J. ....	1,500 00		
Disbursements .....	449 36	1,949 36	
Henderson, C. ....	1,800 00		
Webster, W. A., Assistant .....	1,600 00		
Disbursements .....	484 98	3,884 98	
Johnson, S. M. ....	1,600 00		
Disbursements .....	172 18	1,772 18	
McDonald, H. ....	1,500 00		
Disbursements .....	379 07	1,879 07	
McDougall, J. T. ....	1,600 00		
Disbursements .....	323 86	1,923 86	
MacDonald, S. C. ....	1,600 00		
Disbursements .....	203 92	1,803 92	
Margach, Wm. ....	1,600 00		
Legris, J., Assistant .....	1,300 00		
Disbursements .....	2,642 42	5,542 42	
Maughan, Jos. ....	1,500 00		
Disbursements .....	487 46	1,987 46	
<i>Carried forward</i> .....		50,375 15	



*Appendix No. 6.—Continued.*

Service.	\$ c.	\$ c.	\$ c.
<i>Brought forward</i> .....		50,375 15	
<b>AGENTS' SALARIES AND DISBURSEMENTS.—Concluded</b>			
<i>Timber.—Concluded.</i>			
Oliver, J. A. ....	1,500 00		
Penfold, G. S., Clerk .....	799 97		
Disbursements .....	803 73	3,103 70	
Stevenson, A. ....	1,500 00		
Disbursements .....	389 74	1,889 74	
Watts, Geo. ....	1,500 00		
Disbursements .....	609 75	2,109 75	
<i>Miscellaneous, \$1,594.22.</i>			
Ames, D. H., Caretaker, Islands in Dog and Laboria Lakes .....		20 00	
Bilton, Geo., Caretaker, Islands in North and South Crosby .....		25 00	
Buchan, S., Inspecting Homesteads .....		8 20	
Danis, S., Caretaker, Leonard Islands .....		20 00	
Evans, F., Inspecting Townships of Britton and Rowell .....		75 00	
Guthrie, W., Caretaker of Islands in Devil's Lake .....		25 00	
Langford, Wm., Examining and Valuating Water lots .....		15 00	
Lovering, H. L., Inspecting Islands in Severn River .....		5 00	
McArthur, T. A., Inspector of Agencies .....	600 00		
Disbursements .....	483 60	1,083 60	
Margach, J. A., Inspecting Townships of Britton and Rowell .....		17 42	
Moran, A., Inspecting Township of Burns .....		300 00	
<b>OTTAWA AGENCY.</b>			59,072 56
Darby, E. J., Agent .....		1,500 00	
Larose, S. C., Clerk .....		1,000 00	
Rent .....	500 00		
Disbursements .....	83 51	583 51	
<b>WOOD RANGING.</b>			3,083 51
Allen, R. A. ....		1,150 00	
Ansley, W. E. ....		700 00	
Arnill, William .....		705 00	
Atcheson, Ira M. ....		740 00	
Appleton, E. ....		348 00	
Bailey, S. I. ....		940 00	
Barrett, Thomas .....		1,030 00	
Bates, R. ....		620 00	
Baulk, G. R. ....		260 00	
Bliss, L. E. ....	775 00		
Disbursements .....	645 88	1,420 88	
Bremner, George .....		445 00	
Brooks, W. J. ....		755 00	
<i>Carried forward</i> .....		9,113 88	62,156 07

*Appendix No. 6.—Continued.*

Service.	\$ c.	\$ c.	\$ c.
<i>Brought forward</i> .....		9,113 88	62,156 07
<i>WOOD RANGING.—Continued.</i>			
Brown, J. F. ....		488 00	
Buchan, T. ....		580 00	
Buchan, S. ....		810 00	
Buie, D. ....		670 19	
Buisson, William ....		665 00	
Burns, W. S. ....		542 50	
Callaghan, T. ....		600 00	
Castonguay, A. C. ....		85 00	
Chenier, D. A. ....		945 00	
Clark, W. R. ....		316 00	
Comer, B. F. ....		280 00	
Coomes, Roy ....		20 00	
Corrigan, R. T. ....		950 00	
Coyne, Phin ....		865 00	
Cross, J. G. ....		212 00	
Cross, R. J. ....		284 00	
Didier, H. ....		1,285 00	
Dougherty, J. M. ....		160 00	
Durrill, Wm. ....		1,365 00	
Duval, C. A. ....	775 00		
Disbursements	2 20		
		777 20	
Evans, Fred. ....		17 50	
Faulkner, W. ....		364 00	
Ferguson, E. A. ....		890 00	
Fisher, George ....		1,050 00	
Frankar, A. ....		20 00	
Fraser, D. ....		1,175 00	
Fraser, T. ....		342 00	
Gamey, W. H. ....		720 00	
Gill, C. ....		160 00	
Gilligan, E. ....	845 00		
Disbursements	1 50		
		846 50	
Gorman, J. P. ....		591 73	
Hagan, E. G. ....		685 00	
Harkins, J. J. ....		296 00	
Hartley, C. ....		1,280 00	
Henderson, Chas. ....	Disbursements	29 50	
Hey, Ben. ....		360 00	
Huckson, A. H. ....	885 00		
Disbursements	1,201 37		
		2,086 37	
Hutton, John ....		1,180 00	
Irving, E. ....		585 00	
Johnson, G. N. ....		516 00	
Johnston, T. ....		728 00	
Kay, A. ....		404 00	
Lee, J. B. ....		845 00	
Leroy, L. H. ....		952 00	
Long, H. E. ....		890 00	
Lowe, W. C. ....		340 00	
MacDonald, J. K. ....		16 00	
Macdonell, R. D. ....		775 00	
MacGillivray, D. D. ....		416 00	
MacNamara, J. ....		700 00	
Manice, Wm. ....		1,280 00	
Margach, Wm. ....	Disbursements	401 93	
<i>Carried forward</i> .....		41,956 30	62,156 07

## Appendix No. 6.—Continued.

Service.	\$ c.	\$ c.	\$ c.
<i>Brought forward</i> .....		41,956 30	62,156 07
<i>WOOD RANGING.—Continued.</i>			
Margach, J. A. ....	717 00		
Disbursements .....	16 37		
		733 37	
Maughan, J. .... Disbursements ..		84 30	
Menzies, A. ....		1,100 00	
Milway, J. H. ....		1,695 00	
Molyneaux, G. ....		780 00	
Mooney, L. ....	905 00		
Disbursements .....	28 10		
		933 10	
Mongrain, Chas. ....		39 00	
Morel, H. ....		476 00	
Mulroney, W. J. and G. .... Books ..		9 90	
Murray, Wm. ....		1,695 00	
McAuley, W. D. ....		670 19	
McCaw, J. G. ....		1,560 00	
McDonald, A. ....		676 00	
McDonald, A. J. ....	620 00		
Disbursements .....	95 70		
		715 70	
McDonald, J. D. ....		1,390 00	
McDonald, H. .... Disbursements ..		14 00	
McDonald, T. ....		321 00	
McGrath, B. ....		126 00	
McGregor, C. F. ....		590 00	
McIvor, J. A. ....		832 00	
McKenzie, R. ....		644 00	
McMillan, J. ....		352 00	
McNab, Alex. ....		915 00	
McPherson, J. S. ....		1,390 00	
McRae, D. A. ....		108 00	
Nault, James ....		668 00	
Nevison, W. H. ....		564 00	
Newburn, Wm. ....		745 00	
Niblett, Jas. ....		490 00	
Norgate, C. ....		444 00	
Patterson, M. ....		126 00	
Paul, C. A. ....		1,111 54	
Pigott, John ....		995 00	
Purdy, John ....		140 00	
Revell, L. O. ....		1,565 00	
Ridley, Robt. ....		1,415 00	
Ritchie, J. A. ....		595 00	
Ross, S. ....		1,120 00	
Rowe, F. E. ....		336 00	
Rusk, O. ....		845 00	
Sanderson, Geo. ....		484 00	
Sanderson, D. ....		105 00	
Sharp, J. A. ....		865 00	
Shaw, Alf. ....		1,170 00	
Shaw, D. ....		528 00	
Shields, F. ....		568 00	
Short, J. ....		344 00	
Simmons, A. G. ....		624 00	
Simpson, Wm. ....		810 00	
Sisson, H. P. ....		360 00	
Smith, V. ....		180 00	
Smith, J. D. C. ....		528 00	
<i>Carried forward</i> .....		77,531 40	62,156 07

*Appendix No. 6.—Continued.*

Service.	\$	c.	\$	c.	\$	c.
<i>Brought forward</i> .....			77,531	40	62,156	07
<i>WOOD RANGING.—Concluded.</i>						
				445	00	
Spence, D. ....			1,111	54		
Stein, Paul .....				915	00	
Thompson, G. S. ....				409	00	
Thompson, Harry .....				110	00	
Thomson, L. H. ....				820	00	
Thorpe, Thos. ....				620	00	
Tucker, L. A. ....				1,090	00	
Urquhart, A. ....				1,180	00	
Vincent, H. T. ....				320	00	
Wallace, Fred. ....				584	00	
Watts, W. B. ....				60	00	
Watts, J. J. ....				3	00	
Watts, Geo. ....		Disbursements		300	00	
Webster, W. A. ....		Disbursements		365	00	
Western, C. ....				1,700	00	
Whelan, P. J. ....				485	00	
White, A. T. ....				475	00	
Wilkins, G. N. ....				885	00	
Wilson, D. ....				434	81	
Wood, W. D. ....				890	00	
Yuill, Thomas .....				576	00	
Young, R. J. ....						91,309 75
<i>EXPLORATION AND ESTIMATION OF TIMBER BERTHS.</i>						
				39	00	
Beaudry, Bazil .....				135	00	
Chartrand, Mitchelle .....		Disbursements		903	37	
Henderson, Chas. ....		Disbursements		1,400	13	
Huckson, A. H. ....		Disbursements		544	15	
Webster, W. A. ....		Disbursements		171	00	
Patterson, Malcolm .....				195	00	
Tang, John .....						3,387 65
<i>FIRE RANGING.</i>						
				14	00	
Acheson, Lloyd .....				382	50	
Adams, A. ....				377	50	
Allen, D. ....				370	00	
Allen, T. W. ....				367	50	
Alt, J. C. ....				325	00	
Armstrong, W. H. ....				342	50	
Armstrong, J. G. ....				367	50	
Armstrong, T. C. ....				262	50	
Arnott, Wm. ....				367	50	
Bailey, H. ....				345	00	
Baker, R. O. ....				380	00	
Baker, D. M. ....		Disbursements		671	99	
Bartlett, G. W. ....				382	50	
Bartlett, E. A. ....				255	00	
Bastien, J. ....				382	50	
Bedal, C. ....				357	50	
Beddome, W. E. ....				297	50	
Begin, Paul .....				377	50	
Behaniel, Geo. ....				372	50	
Belanger, E. ....				178	75	
Belanger, X. ....				375	00	
Bell, D. E. ....				208	75	
Bellefuville, M. ....						
			7,760	99	156,853	47
<i>Carried forward</i> .....						



*Appendix No. 6.—Continued.*

Service.	\$ c.	\$ c.	\$ c.
<i>Carried forward</i> .....		7,760 99	156,853 47
<b>FIRE RANGING.—Continued.</b>			
Berry, G. W. ....		200 00	
Berry, Geo. ....		367 50	
Berrige, C. ....		265 00	
Bertrand, H. ....		407 50	
Biederman, Wm. ....		340 00	
Bisaillon, J. H. .... Disbursements		11 20	
Bisaillon, C. H. ....		375 00	
Bissonette, R. ....		370 00	
Black, J. R. ....		28 60	
Blair, Bert ....		20 00	
Blais, O. ....		372 50	
Bliss, L. E. .... Disbursements		1,755 68	
Bonter, S. ....		382 50	
Bookhout, H. ....		365 00	
Bottrell, D. ....		380 00	
Bouchard, M. ....		15 00	
Bowin, J. ....		302 50	
Bowman, J. M. ....		290 00	
Brant, George ....		290 00	
Brown, T. E. ....		367 50	
Brown, Thos. ....		372 50	
Brown, A. ....		375 00	
Brooks, A. ....		515 00	
Brozeau, — ....		397 50	
Brum, A. ....	765 00		
Disbursements	883 63		
		1,648 63	
Brunet, A. ....		372 50	
Bryan, A. E. ....		335 00	
Buchanan, R. F. ....		377 50	
Buie, D. ....	592 00		
Disbursements	31 60		
		623 60	
Buisson, Wm. ....		272 50	
Burger, Wm. ....		382 50	
Burns, R. ....		337 50	
Burns, W. S. ....		612 00	
Buttle, W. W. ....		335 00	
Campbell, D. ....		367 50	
Campbell, Alex. ....		375 00	
Campbell, W. L. ....		367 50	
Cameron, W. J. ....		387 50	
Carnochan, G. ....		385 00	
Cavanagh, S. ....		337 50	
Cesar, H. P. ....		175 00	
Chaffey, William ....		375 00	
Chapman, William ....		375 00	
Chambers, Thomas ....		370 00	
Chatson, Fred. ....		320 00	
Chenier, H. ....		372 50	
Chittick, W. J. ....		312 50	
Christie, W. P. .... Disbursements		463 04	
Christie, W. I. ....	456 00		
Disbursements	114 00		
		570 00	
Clark, H. ....		372 50	
Conture, D. ....		295 00	
Coombs, Jos. ....		314 00	
<i>Carried forward</i> .....		28,157 74	156,853 47

*Appendix No. 6.—Continued.*

Service.	\$ c.	\$ c.	\$ c.
<i>Brought forward</i> .....		28,157 74	156,853 47
<i>FIRE RANGING.—Continued.</i>			
Copley, J. D. ....		330 00	
Countryman, J. S. ....		375 00	
Connigham, J. ....		380 00	
Coyne, Phin. ....	765 00		
Disbursements .....	103 84		
		868 84	
Craigie, H. ....		382 50	
Curry, P. W. M. ....		342 50	
Dance, H. L. ....		324 00	
Dancey, Wm. ....		318 00	
Danis, D. ....		275 00	
Darlington, E. ....		222 50	
Davidson, Ira ....		355 00	
Dean, P. C. ....		377 50	
Dean, A. ....		377 50	
Deagle, E. ....		387 50	
De Laronde, D. ....		247 50	
De Laronde, J. ....		20 00	
Deschamp, N. ....		215 00	
Deschene, A. ....		365 00	
Dial, A. C. ....		367 50	
Didier, H. ....		125 00	
Dingle, R. ....		380 00	
Dobbs, G. W. ....		375 00	
Dougherty, A. E. ....		370 00	
Douglas, Wm. ....		270 00	
Doolittle, R. ....		345 00	
Doyle, James ....		292 50	
Doyle, Gus ....		375 00	
Duff, R. A. ....		535 00	
Duffy, Isaac ....		267 50	
Duncan, R. ....		363 00	
Dyson, W. ....		375 00	
Edgar, G. R. ....		370 00	
Eilber, Geo. ....		382 50	
Elliott, J. ....		370 00	
Ellis, E. C. ....		367 50	
Ellsworth, C. B. ....		382 50	
English, M. ....		385 00	
Fairbairn, N. H. ....	568 00		
Disbursements .....	83 87		
		651 87	
Farrell, S. H. ....		162 50	
Favreau, Geo. ....		382 50	
Ferguson, G. ....		385 00	
Ferguson, Thos. ....		377 50	
Fisher, Geo. ....		564 00	
Fitzback, John ....		250 00	
Fitzgerald, R. ....		345 00	
Fitzpatrick, P. ....		32 00	
Flannigan, J. ....		375 00	
Flynn, M. ....		382 50	
Fraser, W. J. ....		377 50	
Fraser, Alex. ....		365 00	
Fraser, W. A. ....		382 50	
Furry, C. ....		385 00	
Gagne, F. ....	765 00		
Disbursements .....	212 28		
		977 28	
<i>Carried forward</i> .....		47,414 23	156,853 47

*Appendix No. 6.—Continued.*

Service.	\$ c.	\$ c.	\$ c.
<i>Brought forward</i> .....		47,414 23	156,853 47
<i>FIRE RANGING.—Continued.</i>			
Galt, R. ....		357 50	
Gale, W. J. ....		367 50	
Garrow, J. ....		387 50	
Gault, J. ....		397 50	
Gauthier, J. ....		284 00	
Gauthier, Theo. ....		365 00	
Gemmell, John .....	560 00		
Disbursements .....	173 85		
		733 85	
Gervais, F. ....		377 50	
Giles, F. ....		375 00	
Gillanders, G. K. ....		375 00	
Gillies, A. E. ....		312 50	
Giroux, J. O. ....		416 20	
Gladd, A. ....		286 00	
Glover, E. ....		375 00	
Godin, E. ....		152 50	
Goyette, Eug. ....		230 00	
Groulx, R. ....		142 50	
Guthrie, Wm. ....		382 50	
Hackett, Wm. ....		365 00	
Hammond, H. ....		325 00	
Hammond, W. ....		375 00	
Hanbury, H. ....		97 50	
Hand, Thos. ....		548 00	
Hanks, F. ....		372 50	
Hanmer, Geo. ....		387 50	
Hardy, F. ....		247 50	
Hardy, J. ....		190 00	
Hargrave, H. R. ....		345 00	
Harper, G. ....		202 00	
Harris, Geo. ....		375 00	
Hartley, Chas. ....		28 95	
Hays, Jos. ....		250 00	
Henderson, Chas. ....	Disbursements	576 41	
Henderson, J. ....		365 00	
Hennessey, Wm. ....		344 00	
Heroux, J. ....		287 50	
Higgins, Robt. ....		320 00	
Hill, J. E. ....		332 50	
Hollis, J. ....		370 00	
Holmes, J. A. ....		367 50	
Holmes, J. H. ....		377 50	
Hutchinson, Fred. ....		174 00	
Irish, Wm. ....		397 50	
Isbister, J. A. ....		302 50	
James, G. ....		312 50	
Jamieson, K. ....		340 00	
Jarvis, E. ....		377 50	
Jenkins, S. ....	642 00		
Disbursements .....	214 00		
		856 00	
Jodoin, A. ....		7 50	
Jones, R. E. ....		337 50	
Johnston, Wm. ....		336 00	
Johnson, J. ....		14 00	
Johnston, T. ....		49 50	
Johnston, S. ....		327 50	
<i>Carried forward</i> .....		65,013 14	156,853 47

## Appendix No. 6.—Continued.

Service.	\$ c.	\$ c.	\$ c.
<i>Brought forward</i> .....		65,013 14	156,853 47
<i>FIRE RANGING.—Continued.</i>			
Kells, Lorn .....		380 00	
Kelly, T. ....		460 00	
Keily, M. ....		372 50	
Keith, G. R. ....		375 00	
Keenahan, M. ....		382 50	
Kennedy, N. ....		102 50	
Kerr, Alex. ....		274 00	
Kiely, C. A. ....		385 00	
Labell, A. ....		305 00	
Lafontaine, P. ....		166 00	
Lamb, D. ....		382 50	
Langford, Thos. ....		337 50	
Lanktree, J. ....		362 50	
Larocque, M. ....		102 50	
Laurin, J. A. ....		365 00	
Leblanc, O. ....	600 00		
Disbursements .....	48 27		
		648 27	
Lechner, H. ....		152 50	
Leggett, C. ....		382 50	
Legris, John .....	Disbursements	3 15	
Leo, Philip .....		330 00	
Lee, J. B. ....	830 00		
Disbursements .....	518 93		
		1,348 93	
Liddle, H. W. ....		320 00	
Linklater, Wm. ....		330 00	
Lennox, T. A. ....		380 00	
Locheed, R. W. ....		372 50	
Lockhart, W. H. ....		372 50	
Logan, H. ....		347 50	
Long, H. E. ....	790 00		
Disbursements .....	210 10		
		1,000 10	
Loy, Robt. ....		377 50	
MacDonald, S. C. ....	Disbursements	10 45	
Macdonell, R. D. ....		524 00	
Mack, F. ....		298 00	
MacNeill, E. R. ....		382 50	
Margach, Wm. ....	Disbursements	2,419 39	
Margach, J. A. ....		344 00	
Marshall, J. A. ....		377 50	
Manice, Wm. ....		46 55	
Mattison, G. W. ....		365 00	
Maughan, J. ....	Disbursements	87 60	
May, H. ....	820 00		
Disbursements .....	327 75		
		1,147 75	
Menzies, A. ....		520 00	
Merchant, H. ....		397 50	
Merchant, J. ....		380 00	
Mickle, Dymont & Co. ....		35 20	
Micholson, J. ....		10 00	
Miller, R. ....		460 00	
Mitchell, F. ....		285 00	
Molyneaux, G. ....	456 00		
Disbursements .....	114 00		
		570 00	
<i>Carried forward</i> .....		84,791 53	156,853 47



*Appendix No. 6.—Continued.*

Service.	\$ c.	\$ c.	\$ c.
<i>Brought forward</i> .....		84,791 53	156,853.47
<i>FIRE RANGING.—Continued.</i>			
Morand, L.....		382 50	
Morel H. ....		580 00	
Morin, J. ....		382 50	
Moore, B. ....		325 00	
Moore, Jas. ....		367 50	
Moorhouse, C. H. ....		152 00	
Morris, Norman ....		375 00	
Morris, Nelson D. ....		113 75	
Morris, D. D. ....		280 00	
Murray, C. A. B. ....		215 00	
McArthur, J. A. ....		347 50	
McAuley, W. D. ....		592 00	
McCaffrey, L. E. ....		66 66	
McCallum, A. ....		282 50	
McColl, Wm. ....		367 50	
McConnell, E. ....		382 50	
McCulloch, T. ....		317 50	
McCullough, D. J. ....		382 50	
McDonald, Ed. ....		230 00	
McDonald, T. ....		304 00	
McDonell, L. P. ....		195 00	
McEwen, H. A. ....		365 00	
McIntosh, Jas. ....		372 50	
McKay, Alex. ....		285 00	
McKechnie, J. N. ....		214 00	
McKenzie, A. ....		377 50	
McKinnon, H. ....		370 00	
McLarin, W. A. ....		367 50	
McLaughlin, J. ....		372 50	
McLean, M. ....		365 00	
McLeod, F. W. ....		10 00	
McMillan, J. J. ....		365 00	
McMullen, S. J. ....		367 50	
McMurry, John ....		377 50	
McPhee, D. J. ....		355 00	
McPherson, Jas. ....		375 00	
McQuade, H. ....		385 00	
McQuin, W. J. ....		325 00	
McRae, D. A. ....		489 00	
McRae, Ross ....		382 50	
Neelon, G. M. ....		392 50	
Newburn, Wm. ....		560 00	
Netemegesia, A. ....		20 00	
Nockwenogis, L. ....		20 00	
Northcott, A. ....		375 00	
Oldfield, A. ....		152 50	
Oliver, J. A. ....	Disbursements	267 60	
Orange, W. H. ....		115 00	
Ouelette, F. ....		375 00	
Paterson, H. L. ....		67 50	
Patterson, Bert ....		382 50	
Pierce, F. ....		387 50	
Poulin, N. ....		360 00	
Priest, A. H. ....		370 00	
Prestley, J. ....		312 50	
Pringle, A. ....		375 00	
Pritchard, F. ....		445 00	
Pronge, L. ....		352 50	
Proulx, A. ....		387 50	
Quilty, T. J. ....		375 00	
<i>Carried forward</i> .....		104,045 54	156,853 47

*Appendix No. 6.—Continued.*

Service.	\$ c.	\$ c.	\$ c.
<i>Brought forward</i> .....		104,045 54	156,853 47
<i>FIRE RANGING.—Continued.</i>			
Rabbitts, Max .....		608 00	
Racey, M. J. ....		367 50	
Radcliffe, C. A. ....		354 75	
Radford, C. H. ....		382 50	
Ranger, A. ....		392 50	
Read, C. F. ....	397 50		
Disbursements .....	10 00		
		407 50	
Readman, R. E. ....		277 50	
Redden, M. J. ....		385 00	
Reed, C. D. ....		345 00	
Reemus, C. ....		337 50	
Retty, James .....		8 00	
Reeve, E. M. ....		360 00	
Reeves, E. H. ....		367 50	
Ridley, Robt. ....		125 00	
Richardson, J. ....		382 50	
Richardson, J. S. ....		367 50	
Ritchie, J. A. ....		348 00	
Robertson, Wm. ....		127 50	
Rochfort, A. ....		382 50	
Rodden, M. J. ....		365 00	
Row, James .....		382 50	
Rusk, O. ....	805 00		
Disbursements .....	1,742 98		
		2,547 98	
Russell, Alex. ....		356 00	
Ryan, Thos. ....		302 00	
Ryan, Wm. ....		370 00	
Saunders, H. ....		357 50	
Saunderson, S. L. ....		300 00	
Savard, A. ....		377 50	
Sauve, J. ....		377 50	
Scott, Robt. ....		568 00	
Seymour, J. ....		382 50	
Shields, H. ....		365 00	
Shields, F. ....		10 00	
Shilling, Harry .....		292 00	
Short, J. ....		94 50	
Skune, B. ....		302 50	
Sloan, J. ....		365 00	
Small, M. A. ....		367 50	
Smith, E. J. ....		367 50	
Smith, E. J. ....		258 75	
Smith, H. S. ....		365 00	
Smyth, Wm. ....		172 50	
Solomon, J. ....		202 00	
Spearing, F. ....		342 50	
Spence, A. ....		360 25	
Spence, D. ....		380 00	
Spillett, J. J. ....		367 50	
Spillett, A. F. ....		367 50	
Stark, W. ....		372 50	
Stephens, S. J. ....		370 00	
Stewart, J. A. ....	820 00		
Disbursements .....	859 25		
		1,679 25	
Stewart, Chas. ....		370 00	
Stewart, R. ....		375 00	
<i>Carried forward</i> .....		125,205 02	156,853 47

## Appendix No. 6.—Continued.

Service.	\$ c.	\$ c.	\$ c.
<i>Brought forward</i> .....		125,205 02	156,853 47
<i>FIRE RANGING—Concluded.</i>			
Stevens, Alex. ....		372 50	
Stevenson, R. ....		375 00	
Storey, V. H. ....		330 00	
Stubbington, F. J. ....		372 50	
Strain, J. ....		267 50	
Superior Construction Co. ....		188 96	
Thomas, Phil. ....		400 00	
Thomas, E. G. ....		370 00	
Thompson, G. S. ....	564 00		
Disbursements .....	228 95		
		792 95	
Tighe, F. J. ....		460 00	
Tooke, S. ....		375 00	
Toomer, Sam. ....		375 00	
Toussant, J. D. ....		352 50	
Tower, O. ....		604 00	
Trembaly, E. ....		370 00	
Trembley, Theo. ....		370 00	
Turney, W. J. ....		332 50	
Tye, R. H. ....		535 00	
Twigg, J. F. ....		302 50	
Urquhart, A. ....		548 00	
Valois, Pat. ....		367 50	
Walker, G. ....		370 00	
Walker, Geo. ....		365 00	
Wallace, Jas. ....		382 50	
Wallace, W. C. ....		212 50	
Warner, H. B. ....		377 50	
Washburn, B. ....		372 50	
Watson, A. ....		307 50	
Watts, Geo. .... Disbursements		279 13	
Wease, A. ....		387 50	
Webster, R. D. ....		370 00	
Weir, G. A. ....		375 00	
West, W. H. ....		370 00	
Westro, H. ....		367 50	
Welch, J. ....		337 50	
Whalley, H. ....		307 50	
White, R. ....		75 00	
Whiteoak, D. ....		375 00	
Whytock, H. ....		372 50	
Wickens, H. ....		346 50	
Williams, R. A. ....		390 00	
Williams, R. E. ....		380 00	
Williams, J. ....		327 50	
Wilson, H. J. ....		190 00	
Wilson, L. ....		45 50	
Wilson, J. G. ....		367 50	
Wilkins, G. N. ....		560 00	
Windell, Jas. ....		608 00	
Wing, R. H. ....		300 00	
Wooden, John ....		260 00	
Woodcock, Geo. ....		460 00	
Wright, A. ....		360 25	
Wright, John ....		382 50	
Yuill, Maurice ....		297 50	
Young, R. R. ....		380 00	
Young, Jesse ....		175 00	
			145,500 81
<i>Carried forward</i> .....			302,354 28

*Appendix No. 6.—Continued.*

Service.	\$	c.	\$	c.	\$	c.
<i>Brought forward</i> .....						302,354 28
<b>FOREST RESERVES.</b>						
<i>Temagami Reserve—\$46,326.93.</i>						
Albright, L. ....			375	00		
Albright, E. ....			375	00		
Allan, W. N. ....			350	00		
Baldwin, J. F. ....			250	00		
Barraclough, W. W. ....			322	50		
Barrett, Thos. ....	785	00				
Disbursements .....	146	23				
Beatty, J. S. ....			931	23		
Bedford, H. ....			332	50		
Benoit, Ed. ....			357	50		
Bertrand, O. ....			367	50		
Bibet, L. A. ....			367	50		
Bissette, J. ....			375	00		
Boivin, H. ....			372	50		
Brewster, H. S. ....			372	50		
Brook, J. H. ....			332	50		
Brown, J. F. ....			372	50		
Cavill, A. H. ....			167	50		
Champagne, I. ....			372	50		
Chase, T. E. ....			372	50		
Clement, F. W. ....			347	50		
Coombs, F. H. ....			335	00		
Coghill, J. R. ....			340	00		
Corbett, G. E. ....			357	50		
Cronk, S. ....			372	50		
Davidson, R. D. ....			357	50		
D'Embremont, F. ....			372	50		
Desroisiers, John ....			370	00		
Donovan, C. R. ....			260	00		
Ellis, R. A. ....			357	50		
Evans, J. J. ....			357	50		
Faeris, R. ....			247	50		
Fennell, R. E. ....			1,061	50		
Ferguson, N. C. ....			335	00		
Flanigan, H. ....			340	00		
Forsyth, G. ....			332	50		
Gauthier, O. ....			307	50		
Gibson, G. A. L. ....			372	50		
Goodearle, W. E. ....			327	50		
Grenier, Jas. ....			350	00		
Haight, B. ....			372	50		
Haines, H. ....			355	00		
Harkness, A. E. ....			357	50		
Harrison, J. ....			372	50		
Harrison, W. ....			372	50		
Henderson, Charles .....			372	50		
Herlihy, D. ....			42	58		
Herrick, C. P. ....			367	50		
Higgins, L. ....			372	50		
Hindson, C. E. ....			370	00		
Disbursements .....	1,300	00				
	1,247	02				
Holstein, A. ....			2,547	02		
Holland, B. J. ....			360	00		
Johnson, W. J. ....			172	50		
			345	00		
<i>Carried forward</i> .....			21,047	33		302,354 28



*Appendix No. 6.—Continued.*

Service.	\$ c.	\$ c.	\$ c.
<i>Brought forward</i> .....		21,047 33	302,354 28
<i>FOREST RESERVES.—Continued.</i>			
<i>Temagami Reserve.—Continued.</i>			
Keats, G. ....		52 50	
Keenan, J. ....		372 50	
Kennedy, W. ....		560 00	
Kirkup, N. B. ....		345 00	
Lamarche, A. ....		912 50	
Lamarche, C. A. ....		372 50	
Larmour, R. R. ....		367 50	
Latoure, John ....		360 00	
Lewis, G. T. ....		370 00	
Livingstone, J. ....		377 50	
Lyon, J. W. ....		367 50	
Masson, D. M. ....		372 50	
Mansfield, J. ....		360 00	
Maynard, W. B. ....		317 50	
Melville, R. ....		332 50	
Montgomery, A. ....		377 50	
Montriel, Joe ....		310 00	
Morel, H. ....		50 00	
Murphy, P. ....		372 50	
McCadden, P. ....		372 50	
McClennaghan, A. R. ....		372 50	
McGuire, T. ....		367 50	
McKay, A. ....		367 50	
McLeod, J. D. ....		362 50	
McPherson, N. ....		330 00	
Nadon, P. ....		372 50	
Neil, W. ....		372 50	
Nicholas, H. ....		372 50	
O'Neil, W. S. ....		372 50	
Papineau, Joe ....		375 00	
Passmore, S. ....		372 50	
Perron, M. ....		220 00	
Philpot, G. N. ....		340 00	
Powell, John ....		372 50	
Reid, J. T. ....		332 50	
Robertson, N. S. ....		335 00	
Rochon, J. ....		912 50	
Rochon, F. ....		372 50	
Rowntree, C. E. ....		305 00	
Russell, F. ....		372 50	
Sage, P. ....		370 00	
Sasseville, J. ....		207 50	
Scott, J. K. ....		287 50	
Shannon, P. R. ....		340 00	
Shelson, H. ....		367 50	
Simpson, Theo. ....		370 00	
Smith, F. R. ....		345 00	
Smith, C. E. ....		285 00	
Sparks, W. E. L. ....		345 00	
Sturgeon, E. W. ....		357 50	
Stevenson, G. H. ....		345 00	
Sutton, Fred. ....		370 00	
Thorley, C. W. ....		370 00	
Vivaris, D. ....		912 50	
Vivaris, M. ....		372 50	
Wagner, H. W. ....		375 00	
Westman, L. E. ....		340 00	
<i>Carried forward</i> .....		42,329 83	302,354 28

*Appendix No. 6.—Continued.*

Service.	\$ c.	\$ c.	\$ c.
<i>Brought forward</i> .....		42,329 83	302,354 28
<i>FOREST RESERVES.—Continued.</i>			
<i>Temagami Reserve.—Concluded.</i>			
Western, C. ....		372 50	
White, J. ....		355 00	
Whitney, K. H. ....		305 00	
Wender, Alf. ....		372 50	
Williams, C. ....		372 50	
Willons, C. E. ....		292 50	
Willoughby, J. B. ....		327 50	
Wilson, H. P. ....		375 00	
Wilson, B. ....		372 50	
Young, R. J. ....	790 00		
Disbursements .....	62 10		
		852 10	
<i>Metagami Reserve, \$8,882.88.</i>			
Briggs, A. V. ....		272 50	
Burden, John .....	905 00		
Disbursements .....	302 88		
		1,207 88	
Butterfield, J. ....		390 00	
Cromarty, R. P. ....		337 50	
Dixon, H. A. ....		347 50	
Hughes, J. E. L. ....		360 00	
Jefferies, W. G. ....		275 00	
Lawrence, C. F. ....		272 50	
Manerd, N. ....		315 00	
Marchell, I. ....		360 00	
Marks, V. ....		360 00	
McCandless, J. W. ....		357 50	
McFayden, James .....		355 00	
McIntyre, J. S. ....		360 00	
Ogg, C. S. ....		355 00	
Porter, C. H. ....		357 50	
Reid, J. ....		412 50	
Scullard, G. ....		347 50	
Stirrett, H. C. ....		357 50	
Taylor, W. J. ....		390 00	
Taylor, J. S. ....		355 00	
Thomson, Thomas .....		390 00	
Vowles, F. J. ....		347 50	
<i>Mississaga Reserve, \$12,680.63.</i>			
Allan, George .....		390 00	
Belanger, Thos. ....		392 50	
Belaney, Archie .....		395 00	
Bickell, R. R. ....		392 50	
Boyd, D. J. ....		367 50	
Burden, J. H. ....		395 00	
Burden, Wm. ....		387 50	
Cameron, Bruce .....		370 00	
Cameron, George .....		385 00	
Copp, F. C. ....		390 00	
Dougherty, E. A. ....		380 00	
<i>Carried forward</i> .....		59,454 81	302,354 28

## Appendix No. 6.—Continued.

Service.	\$ c.	\$ c.	\$ c.
<i>Brought forward</i> .....		59,454 81	302,354 28
<b>FOREST RESERVES.—Continued.</b>			
<i>Mississaga Reserve.—Concluded.</i>			
Duval, C. A. ....	845 00		
Disbursements .....	355 78		
		1,200 78	
Dyson, Isaac .....		370 00	
Esson, Thomas .....		197 50	
Eveline, H. ....		372 50	
Eveline, A. ....		372 50	
Eveline, Stanley .....		225 00	
Featherstonehaugh, M. H. ....		390 00	
Findlayson, C. ....		365 00	
Garrett, F. A. ....		372 50	
Hall, Thomas .....		392 50	
Haskett, K. R. ....		367 50	
Hodder, F. ....		52 50	
Hope, L. S. ....		282 50	
Jean, A. ....		382 50	
Knox, D. ....		355 00	
McCallum, A. J. ....		347 50	
McClelland, R. S. ....		332 50	
Miller, J. W. ....		222 50	
Murphy, J. W. ....		370 00	
Putney, A. F. ....		365 00	
Sawyers, C. E. ....		372 50	
Taylor, J. R. ....		332 50	
Wright, H. V. ....		370 00	
Young, William .....	12 50		
Disbursements .....	12 35		
		24 85	
<i>Nepigon Reserve, \$12,264.73.</i>			
Allan, J. B. ....		297 50	
Blair, Bert .....		430 00	
Bliss, L. E. ....	920 00		
Disbursements .....	2,993 98		
		3,913 98	
Bouchard, J. ....		485 00	
Bouchard, M. ....		117 50	
Burns, W. S. ....		48 00	
Coombs, J. ....		50 00	
Couch, R. ....		367 50	
Copley, J. D. ....		30 00	
DeLaronde, D. ....		30 00	
Ferris, R. ....		370 00	
Fitzpatrick, P. ....		280 00	
Fraser, G. ....		362 50	
Hardy, F. ....		30 00	
Harris, R. ....		327 50	
Harper, G. ....		30 00	
Heffernan, J. J. ....		402 50	
Higgins, R. ....		47 50	
Husband, A. C. ....		277 50	
Judge, S. E. ....		400 00	
King, G. E. ....		337 50	
Lafontaine, Paddy .....		67 50	
<i>Carried forward</i> .....		76,592 42	302,354 28

*Appendix No. 6.—Continued.*

Service.	\$ c.	\$ c.	\$ c.
<i>Brought forward</i> .....		76,592 42	302,354 28
<i>FOREST RESERVES.—Concluded.</i>			
<i>NEPIGON RESERVE.—Concluded.</i>			
Linklater, Wm. ....		30 00	
Lower, A. R. ....		325 00	
McDowell, T. W. ....		312 50	
Monahan, P. ....		355 00	
Pigeon, C. ....		392 50	
Rae, A. ....		485 00	
Ritchie, S. ....		317 50	
Sadsbury, Martin ....		567 75	
Scott, C. V. ....		332 50	
Shilling, H. ....		67 50	
Solomon, J. ....		30 00	
Young, N. M. ....		347 50	
<i>Eastern Reserve, \$2,941.56.</i>			
Brown, Geo. ....		382 50	
Drysdale, S. ....		377 50	
Egan, Wm. .... Disbursements		21 40	
Shultz, J. ....		382 50	
Snider, L. ....		382 50	
Stewart, Wm. ....		382 50	
Tapping, Thos. ....	566 00		
Disbursements .....	64 16		
		630 16	
Young, Geo. ....		382 50	
<i>Sibley Reserve, \$835.00.</i>			
Hornick, Geo. ....		367 50	
Oliver, J. A. ....		100 00	
Quinn, J. J. ....		367 50	
<i>Quetico Reservē, \$4,077.00.</i>			
Bone, H. ....		280 00	
Darby, W. ....		280 00	
Gadd, H. ....		280 00	
Gibson, W. T. ....		280 00	
Johnson, R. G. ....		280 00	
King, A. ....		275 00	
Leham, W. ....		280 00	
Martin, E. ....		277 50	
McDonald, D. ....		280 00	
McDonald, A. ....		275 00	
Sexsmith, R. ....		277 50	
Sturdy, R. ....		280 00	
Wall, Geo. ....		452 00	
Wall, S. ....		280 00	
			88,008 73
<i>Carried forward</i> .....			390,363 01



*Appendix No. 6.—Continued.*

Service.	\$ c.	\$ c.	\$ c.
<i>Brought forward</i> .....			390,363 01
FORESTRY.			
Newman, F. S., Assistant Forester, services one month .....		133 34	
Brock, John, Purchase of S. $\frac{1}{2}$ , N. $\frac{1}{2}$ , Lot 24, Con. 5, Township of Walsingham.....		1,000 00	
Bell Telephone Company .....	20 50		
Express .....	123 45		
		143 95	
Labor .....		4,471 28	
Supplies .....		1,660 01	
			7,408 58
MINES AND MINING.			
Miller, W. G., Provincial Geologist, services.....	4,350 00		
Disbursements .....	245 95		
		4,595 95	
Knight, C. W., 1st Assistant Geologist, services...	2,150 00		
Disbursements .....	304 29		
		2,454 29	
Burrows, A. G., 2nd Assistant Geologist, services..	2,050 00		
Disbursements .....	288 41		
		2,338 41	
Hopkins, P. E., 3rd Assistant Geologist, services..	1,250 00		
Disbursements .....	176 83		
		1,426 83	
Mickle, G. R., Mine Assessor, services .....	4,000 00		
Disbursements .....	710 50		
		4,710 50	
Godson, T. E., Mining Commissioner, services....	3,857 54		
Dance, R. W., Mining Commissioner's Clerk, services .....	1,400 00		
Disbursements .....	1,422 43		
		6,679 97	
Corkill, E. T., Inspector of Mines, services.....	1,875 00		
Disbursements .....	531 00		
		2,406 00	
Sutherland, T. F., Inspector of Mines, services....	2,350 00		
Disbursements .....	1,365 50		
		3,715 50	
Collins, E. A., 1st Assistant Inspector of Mines, services .....	1,672 80		
Disbursements .....	1,146 74		
		2,819 54	
McMillan, J. G., 2nd Assistant Inspector of Mines, services .....		127 48	
Rogers, R. W., Topographer, services .....	1,750 00		
Disbursements .....	57 20		
		1,807 20	
McArthur, T. A., Inspector of Recorders' Offices, services .....	600 00		
Disbursements .....	444 03		
		1,044 03	
Coleman, Dr. A. P., Disbursements .....		165 10	
Barfoot, Thos. ....		167 89	
Bell, Wm. ....		251 35	
Parsons, A. L., Disbursements .....		101 90	
Rothwell, T. E., Disbursements .....		33 30	
Scott, John .....	600 00		
Disbursements .....	326 25		
		926 25	
<i>Carried forward</i> .....		35,771 49	397,771 59

*Appendix No. 6.—Continued.*

Service.	\$ c.	\$ c.	\$ c.
<i>Brought forward</i> .....		35,771 49	397,771 59
<i>MINES AND MINING.—Concluded.</i>			
Sharpe, Donald .....	700 00	1,012 23	37,553 94
Disbursements .....	312 23		
Smith, R. M. ....	375 96	405 96	
Disbursements .....	30 00		
Webster, Jas. E. ....		27 00	
Young, Roy W. ....		197 50	
Express .....		6 05	
King's Printer .....		130 32	
Micklethwaite, F. W. ....		3 39	
<i>MINING RECORDERS.</i>			
Bowker, S. T., Recorder .....	1,000 00	1,346 08	
Disbursements .....	346 08		
Campbell, C. A., Recorder .....	900 00	2,648 00	
Washburn, H. C., Clerk .....	720 00		
Glazier, M. B., Clerk .....	124 62		
Young, Miss E., Stenographer .....	505 00		
Disbursements .....	398 38		
Gauthier, G. H., Recorder .....	1,500 00	5,310 67	
Graham, F. W., Clerk .....	1,200 00		
Glazier, M. B., Clerk .....	450 00		
O'Brien, J. D., Clerk .....	1,020 00		
Disbursements .....	1,140 67		
Hough, J. A., Recorder .....	1,200 00	3,684 28	
Browning, A. J., Clerk .....	929 16		
Glazier, M. B., Clerk .....	450 00		
Gardiner, Miss I. M., Stenographer .....	451 00		
Disbursements .....	654 12		
McQuire, H. F., Recorder .....	500 00	664 08	
Disbursements .....	164 08		
Morgan, J. W., Recorder .....	1,000 00	1,313 70	
Disbursements .....	313 70		
Sheppard, H. E., Recorder .....	1,000 00	1,228 05	
Disbursements .....	228 05		
Skill, A., Recorder .....	1,200 00	1,357 15	
Disbursements .....	157 15		
<i>Carried forward</i> .....		17,552 01	435,325 53

*Appendix No. 6.—Continued.*

Service.	\$ c.	\$ c.	\$ c.
<i>Brought forward</i> .....		17,552 01	435,325 53
MINING RECORDERS.— <i>Concluded.</i>			
Smith, G. T., Recorder .....	2,300 00		
Meagher, T. J., Clerk .....	525 00		
Sarsfield, J. M., Clerk .....	1,100 00		
Ferguson, L. H., Clerk .....	959 96		
Monroe, Miss E., Stenographer .....	720 00		
Smith, Miss M. H., Stenographer .....	486 23		
Disbursements .....	1,034 69	7,125 88	
Spry, W. L., Recorder .....	682 20		
Disbursements .....	20 20	702 40	
Express .....	140 75		
Harcourt, E. H., Co. ....	72 86		
King's Printer .....	598 31		
Methodist Book Room .....	112 54	924 46	
			26,304 75
PROVINCIAL ASSAY OFFICE.			
McNeill, W. K. ....	1,714 10		
Disbursements .....	68 70	1,782 80	
Rothwell, T. E. ....	1,009 00		
Disbursements .....	350 60	1,359 60	
Supplies .....		343 20	
Disbursements .....		76 90	
			3,562 50
CULLERS' ACT.			
Currie, D. H., services .....		8 00	
McDougall, J. T., Disbursements .....		32 35	
			40 35
<i>Expenses not otherwise provided for.</i>			
Nicol, Wm., Salary and Disbursements <i>re</i> Toronto Exhibition .....		400 00	
General Disbursements <i>re</i> Toronto Exhibition .....		137 30	
Nicol, Wm., <i>re</i> Windsor Exhibition, .....	55 00		
Disbursements .....	35 40	90 40	
			627 70
SURVEYS .....			89,123 51
BOARD OF SURVEYORS .....			200 00
EXPERIMENTAL TREATMENT OF ORE .....			200 00
REFUNDS—Miscellaneous .....		13,986.24	
do Algoma Central Railway .....		94,047 03	108,033 27
<i>Carried forward</i> .....			663,417 61

*Appendix No. 6.—Concluded.*

Service.	\$ c.	\$ c.	\$ c.
<i>Brought forward</i> .....			663,417 61
CONTINGENCIES.			
<i>Departmental.</i>			
Printing and Binding .....	2,139 40		
Stationery .....	5,909 41	8,048 81	
Postage .....	1,775 95		
Express .....	434 90	2,210 85	
Telegraphing .....	481 38		
Bell Telephone Company .....	38 55		
Car fare .....	40 00	559 93	
Subscriptions .....	309 40		
Advertising .....	3,673 92	3,983 32	
Typewriters, rent and repairs .....		215 25	
Hearst, Hon. W. H., Travelling expenses .....	300 00		
Rorke, L. V., Travelling expenses .....	97 69		
Stewart, A. M., Legal fees .....	110 00		
White, Aubrey, Travelling expenses .....	30 25		
Zavitz, E. J., Travelling expenses .....	246 75	784 69	
Extra Clerks .....	4,491 68		
Sundries .....	81 36	4,573 04	
BUREAU OF MINES.			20,375 89
Printing and Binding .....	2,467 30		
Stationery .....	3,715 30	6,182 60	
Postage .....	475 16		
Telegraphing .....	232 37		
Express and cartage .....	61 80		
Advertising .....	1,051 80		
Subscriptions .....	405 68		
Maps .....	2,685 90	4,912 71	
Gibson, T. W., Travelling expenses .....		35 35	
Typewriters, repairs, etc. ....	128 00		
Bell Telephone Company .....	8 60	136 60	
Legal fees .....	299 67		
Nicholas, F. J., Preparing index .....	255 00		
Sundries .....	436 20	990 87	
			12,258 13
			696,051 63
D. GEO. ROSS, Accountant.		AUBREY WHITE, Deputy Minister, Lands and Forests.	



*Appendix No. 7.*

Statement of Expenses on account of various Services under the direction of the Department of Lands, Forests and Mines, for the year ending October 31st, 1913.

Service.	\$ c.	\$ c.	\$ c.
ALGONQUIN PARK .....			21,554 09
VETERANS' COMMUTATION .....			450 00
EXPLORATION PARTY IN NEW TERRITORY .....			2,932 64
NORTHERN DEVELOPMENT .....			
Whitson, J. F., Salary .....	4,000 00		
Bruce, A. E. D., do .....	1,969 81		
Stewart, L. D. N., do .....	1,418 24		
Lang, J. L., do .....	1,255 36		
Laird, R., do .....	1,133 33		
Chalmers, D., do .....	1,540 00		
Robinson, W. J., do .....	1,500 00		
Moore, J., do .....	1,449 99		
Mills, W. W., do .....	1,075 00		
Fraser, J., do .....	816 00		
Beardall, F. G., do .....	1,284 60		
Laidlaw, Miss B., do .....	428 33		
Extra Clerks .....	3,007 99		
		20,878 65	
Wages .....	611,746 72		
Contracts .....	114,409 02		
Supplies .....	334,137 89		
		1,060,293 63	
BOUNTY ACT VII., EDWARD VII., CAP. 14.			1,081,172 28
Coniagas Reduction Company .....		13,301 93	
Deloro Mining Reduction Company .....		998 07	
Dominion Refineries, Limited .....		62 59	
			14,362 59
			1,120,471 60

D. GEO. ROSS,  
Accountant.

AUBREY WHITE,  
Deputy Minister of Lands and Forests.

*Appendix No. 8.*

## WOODS AND FORESTS.

Statement of revenue collected during the year ending October 31st, 1913.

	\$	c.
Amount of Western collections at Department.....	1,753,022	84
do Belleville collections " .....	19,454	12
do Ottawa collections.....	206,648	85
	1,979,125	81

J. A. G. CROZIER,  
Chief Clerk in Charge.

AUBREY WHITE,  
Deputy Minister.

*Appendix No. 9.*

## PATENTS BRANCH.

Statement of Patents, etc., issued by the Patents Branch from 1st November, 1912, to  
31st October, 1913.

Public Lands (late Crown) .....	822
" " (late School) .....	15
" " (late Clergy Reserves) .....	9
" " (University) .....	17
Free Grant Lands (A.A.) (This series now discontinued) .....	39
" " " (Act of 1880) discontinued .....	212
" " " (Act of 1913) .....	253
" " " (Act of 1901) (Veterans) .....	926
Mining Lands .....	896
Mining do (University) .....	15
Mining Leases .....	263
Crown Leases .....	34
Licenses of Occupation .....	28
Temagami Leases .....	3
Pine .....	3
Total .....	3,535

CHARLES S. JONES,  
Chief Clerk.

AUBREY WHITE,  
Deputy Minister.

Appendix

WOODS AND

Statement of Timber and Amounts accrued from Timber Dues, Ground

QUANTITY AND

Agencies.	Area covered by timber licenses.	Saw logs.			
		Pine.		Other.	
	Square miles.	Pieces.	Feet B.M.	Pieces.	Feet B.M.
Western Timber District .....	12,485 $\frac{3}{4}$	7,230,192	280,810,994	1,129,176	34,133,013
Belleville Timber District .....	957 $\frac{1}{4}$	73,071	1,838,987	295,791	9,815,144
Ottawa Timber District .....	4,076 $\frac{1}{4}$	1,259,035	56,152,030	583,617	14,755,269
	17,519 $\frac{1}{4}$	8,562,298	338,802,011	2,008,584	58,703,426

General Statemen

Agencies.	Cordwood.		Tan Bark.	Railway Ties.	Posts.	Poles.	Stave Bolts.	Pulpwood,
	Hard.	Soft.						
	Cords.	Cords.	Cords.	Pieces.	Cords.	Pieces.	Cords.	Cords.
Western Timber District .....	30,927 $\frac{1}{2}$	37,095	3,725	6,321,675	2	1,291	2,874	120,159
Belleville Timber District .....	.....	.....	78 $\frac{1}{2}$	1,399	75	957	.....	13
Ottawa Timber District .....	.....	1,999	705	32,754	12 $\frac{3}{4}$	2,473	.....	11,262
	30,927 $\frac{1}{2}$	39,094	4,508 $\frac{1}{2}$	6,355,828	89 $\frac{3}{4}$	4,721	2,874	131,434

J. A. G. CROZIER,  
Chief Clerk in Charge



No. 10.

## FORESTS.

Rent and Bonus during the year ending 31st October, 1913.

## DESCRIPTION OF TIMBER.

Boom and Dimension Timber.				Square Timber.		Piling.			Cedar.
Pine.		Other.		Pine.					
Pieces.	Feet B.M.	Pieces.	Feet B.M.	Pieces.	Cubic feet.	Lineal feet.	Pieces	Ft.B.M.	Lineal feet.
97,489	13,041,766	52,299	3,831,073	10,349	511,490	512,640	10,627	701,061	122,907
1,411	223,611	4,692	874,773	.....	.....	.....	.....	.....	.....
15,328	2,192,700	7,142	786,703	.....	.....	.....	.....	.....	1,296
114,228	15,458,077	64,133	5,492,549	10,349	511,490	512,640	10,627	701,061	124,203

of Timber.—Concluded.

## Amounts accrued.

Trans-fer bonus.	Interest.	Trespass.	Timber dues.	Bonus.	Deposits timber sales 1913.	Ground rent.	Total.
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
6,770 00	8,456 11	17,324 66	1,155,437 92	614,227 86	101,940 50	70,282 00	1,974,439 05
70 00	60 65	1,301 48	11,389 26	.....	.....	4,990 00	17,811 39
3,660 25	498 81	998 88	105,989 18	.....	.....	23,825 00	134,972 12
10,500 25	9,015 57	19,625 02	1,272,816 36	614,227 86	101,940 50	99,097 00	2,127,222 56

AUBREY WHITE,  
Deputy Minister.

Appendix No. 11.

Statement of work done in the Military branch of the Department of Lands, Forests and Mines, during the year 1913.

References for Veteran Patents issued .....	844
Locations under military certificates .....	146
Certificates applied in payment of lands .....	34
Certificates surrendered for commutation money .....	9
Letters received .....	5,350
Letters written .....	5,160
Special letters to agents .....	800
Special letters to mining recorders .....	250
Maps and reports supplied to veterans .....	1,400
Printed forms .....	1,200
Copies of Veteran Act supplied .....	450

H. E. JOHNSTON,  
Chief Clerk in Charge.

AUBREY WHITE,  
Deputy Minister.

Appendix No. 12.

Statement of the number of Letters received and mailed by the Department in 1910-11, 1911-12 and 1912-13.

Year,	Letters received.					Names indexed.	Orders-in-Council.	Returned letters.	Letters, circulars and reports mailed from Department.
	Sales and Free Grants.	Surveys.	Woods and Forests.	Mines.	Totals.				
1910-11	24,705	14,478	9,212	8,220	56,615	63,200	180	94	67,150
1911-12	20,050	10,150	7,700	8,750	50,407	57,000	150	76	63,125
1912-13	27,658	11,775	7,219	8,800	55,452	61,500	150	75	65,280

FRANK YEIGH,  
Registrar,

AUBREY WHITE,  
Deputy Minister.

## Appendix No. 13.

Statement showing the number of Locatees and of acres located; of purchasers and of acres sold; of lots resumed for non-performance of the settlement duties and of patents issued in Free Grant Townships during the year ending 31st October, 1913.

Township.	District or County.	Agent.	No. of persons located.	No. of acres located.	No. of purchasers.	No. of acres sold.	No. of lots resumed.	No. of patents issued.
Baxter .....	Muskoka. ....	J. B. Brown, Bracebridge..	6	395	11	108	3	14
Brunel .....	"	"	5	500	...	...	2	1
Cardwell .....	"	"	1	106	...	...	3	2
Chaffey .....	"	"	3	297	...	...	3	3
Draper .....	"	"	...	...	...	...	...	1
Franklin .....	"	"	3	479	21	70	6	19
Freeman .....	"	"	4	610	...	...	1	...
Macaulay .....	"	"	...	...	...	...	...	...
Medora .....	"	"	1	95	3	1	2	4
Monck .....	"	"	...	...	1	1	...	1
Morrison .....	"	"	3	377	8	167	...	9
Muskoka .....	"	"	1	200	5	29½	1	3
McLean .....	"	"	3	491	1	1	1	1
Oakley .....	"	"	5	603	...	...	5	2
Ridout .....	"	"	2	273	...	...	1	3
Ryde .....	"	"	2	200	...	...	1	1
Sherborne....	"	"	4	451	1	15	1	2
Sinclair .....	"	"	3	458	...	...	2	2
Stephenson....	"	"	2	198	...	...	2	1
Stisted .....	"	"	1	60	1	½	1	3
Watt .....	"	"	1	97	1	25	...	2
Wood .....	"	"	7	1,187	20	118	8	22
Burpee .....	Parry Sound..	F. R. Powell, Parry Sound.	3	600	...	...	...	...
Carling .....	"	"	11	1,700	1	44	7	5
Christie .....	"	"	13	1,611	...	...	9	2
Conger .....	"	"	16	2,306	...	...	13	2
Cowper .....	"	"	...	...	...	...	...	5
Ferguson .....	"	"	...	...	...	...	1	...
Foley .....	"	"	...	...	...	...	...	1
Hagerman .....	"	"	2	201	...	...	1	2
Harrison .....	"	"	...	...	3	39	...	11
Henvey .....	"	"	11	1,074	...	...	...	...
Humphrey .....	"	"	5	578	2	2	6	3
McConkey .....	"	"	5	584	...	...	4	2
McDougall .....	"	"	6	896	2	2	3	3
McKellar .....	"	"	2	301	...	...	1	...
McKenzie .....	"	"	...	...	...	...	...	5
Monteith .....	"	"	6	844	2	2	2	7
Shawanaga .....	"	"	...	...	...	...	...	11
Wilson .....	"	"	1	200	2	2	1	2
Chapman ....	Parry Sound .	Dr. J. S. Freeborn, Magnet- awan	4	447	3	108	6	4
Croft .....	"	"	3	500	...	...	1	1
Ferrie .....	"	"	...	...	...	...	...	2
Gurd .....	"	"	6	832	...	...	4	7
Lount .....	"	"	2	200	...	...	2	1
Machar .....	"	"	7	1,196	1	147	9	4
Mills .....	"	"	8	1,315	2	19	1	2

## Appendix No. 13.—Continued.

Township.	District or County.	Agent.	No. of persons located.	No. of acres located.	No. of purchasers.	No. of acres sold.	No. of lots resumed.	No. of patents issued.
Pringle .....	Parry Sound..	Dr. J. S. Freeborn, Magnet- awan.	11	1,748	3	94	2	1
Ryerson .....	"	"	3	498	...	...	1	2
Spence .....	"	"	1	113	...	...	1	4
Strong .....	"	"	4	599	...	...	2	2
Armour .....	Parry Sound..	W. Jenkin, Emsdale. ....	4	428	1	7	5	1
Bethune .....	"	"	3	511	...	...	1	...
Joly .....	"	"	5	767	3	59	1	5
McMurrich .....	"	"	3	551	...	...	1	2
Perry .....	"	"	1	100	...	...	1	1
Proudfoot .....	"	"	5	563	2	22	2	7
Hardy .....	Parry Sound..	H. J. Ellis, Powassan.. ....	3	300	...	...	1	1
Himsworth .....	"	"	17	2,510	4	59	14	12
Laurier .....	"	"	...	...	1	15	...	7
Nipissing .....	"	"	6	869	8	35	4	9
Patterson .....	"	"	2	200	1	8	...	1
Bonfield .....	Nipissing ....	W. J. Parsons, North Bay...	11	1,274	2	73	6	5
Boulter (pt) .....	"	"	...	...	...	...	...	1
Chisholm .....	"	"	15	1,686	...	...	7	16
Ferris .....	"	"	27	2,947	5	104½	21	12
Anson .....	Haliburton ...	R. H. Baker, Minden.....	2	198	...	...	...	...
Glamorgan .....	"	"	1	166	...	...	1	2
Hindon .....	"	"	1	102	...	...	1	1
Lutterworth .....	"	"	6	602	2	92	3	4
Minden .....	"	"	2	200	1	100	4	1
Snowdon .....	"	"	3	300	...	...	1	2
Stanhope .....	"	"	1	101	...	...	...	2
Anstruther .....	Peterboro' ..	William Hales, Apsley .....	1	203	...	...	2	1
Burleigh, N.D. ....	"	"	...	...	...	...	...	2
" S.D. ....	"	"	...	...	...	...	...	1
Chandos .....	"	"	2	245	...	...	2	2
Methuen .....	"	"	...	...	...	...	1	...
Cardiff .....	Haliburton ...	James Wilson, Kinmount...	2	270	...	...	2	...
Cavendish .....	Peterboro' ..	"	2	198	2	62	1	4
Galway .....	Peterboro' ..	"	11	1,294	2	53	2	3
Monmouth .....	Haliburton ...	"	7	1,101	...	...	4	5
Bangor .....	Hastings ...	W. J. Douglas, Greenview....	4	468	...	...	3	1
Carlaw .....	"	"	2	322	...	...	2	4
Cashel .....	"	"	...	...	...	...	...	...
Dungannon .....	"	"	4	407	3	277	2	...
Faraday .....	"	"	4	439	...	...	2	3
Herschel .....	"	"	10	1,306	1	4	5	6
Limerick .....	"	"	1	172	...	...	1	...
Mayo .....	"	"	7	515	...	...	5	3
Monteagle .....	"	"	14	1,342	2	9	11	5
McClure .....	"	"	7	951	...	...	6	2
Wicklow .....	"	"	11	1,003	1	11	9	3
Wollaston .....	"	"	...	...	...	...	...	...
Algona, S. ....	Renfrew ....	Adam Prince, Wilno.....	2	119	...	...	1	2
Brougham .....	"	"	8	904	1	30	...	3



## Appendix No. 13.—Continued.

Township.	District or County.	Agent.	No. of persons located.	No. of acres located.	No. of purchasers.	No. of acres sold.	No. of lots resumed.	No. of patents issued.
Brudenell ...	Renfrew ....	Adam Prince, Wilno.....	2	198	...	...	...	2
Burns .....	"	"	8	881	...	...	7	2
Grattan .....	"	"	1	204	1	4	1	1
Griffith .....	"	"	1	100	...	...	1	1
Hagarty .....	"	"	1	100	...	...	1	2
Jones .....	"	"	3	243	1	33	1	...
Lyell .....	Nipissing ....	"	1	50	1	200	...	1
Lyndoch .....	Renfrew .....	"	1	115	...	...	...	1
Matawatchan.	"	"	1	197	...	...	1	...
Radcliffe .....	"	"	5	617	1	49½	2	3
Raglan .....	"	"	3	356	1	50	1	1
Richards .....	"	"	6	636	1	8	4	2
Sebastopol ..	"	"	4	364	...	...	...	2
Sherwood .....	"	"	5	600	1	60	4	2
Algona, N....	Renfrew .....	Finlay Watt Pembroke.....	...	...	...	...	...	...
Alice .....	"	"	...	...	...	...	...	1
Buchanan (pt)	"	"	1	100	...	...	2	1
Fraser .....	"	"	3	502	1	11	...	1
Head .....	"	"	2	306	...	...	...	1
Maria .....	"	"	...	...	...	...	...	...
McKay (pt) ..	"	"	...	...	...	...	...	...
Petawawa ...	"	"	2	302	2	1	1	...
Rolph .....	"	"	3	400	1	21	...	1
Wilberforce ..	"	"	...	...	...	...	...	2
Wylie (pt)....	"	"	1	100	...	...	...	2
Calvin .....	Nipissing ....	Robert Small, Mattawa. ....	4	407	...	...	1	2
Cameron (pt).	"	"	4	427	...	...	...	1
Lauder .....	"	"	2	292	...	...	...	...
Mattawan....	"	"	3	405	...	...	1	2
Papineau .....	"	"	7	851	1	38	4	3
Korah .....	Algoma .. ...	Edw'd Noble, Sault Ste. Marie	1	80	...	...	1	...
Parke .....	"	"	...	...	...	...	...	...
Prince .....	"	"	2	268	1	50	1	6
Aberdeen ....	Algoma .....	Thos. Buchanan, Thessalon.	2	237	2	26	...	3
" add. ....	"	"	...	...	...	...	...	...
Galbraith....	"	"	8	1,297	2	14½	1	2
Lefroy .....	"	"	...	...	1	159	...	2
Plummer .....	"	"	...	...	...	...	...	...
" add. ....	"	"	...	...	...	...	...	...
St. Joseph Is'd	Algoma .....	W. E. Whybourne, Marksville	13	1,158	...	...	12	1
Baldwin (pt.).	Algoma .....	Neil Mulvaney, Espanola...	7	840	6	24½	...	4
Merritt.....	"	"	12	1,641	2	64	3	6
Blake.....	Thunder Bay.	W. A. Burrows, Port Arthur	26	4,160	5	800	10	7
Conmee .....	"	"	32	4,749	4	17	19	11
Crooks .....	"	"	29	4,472	5	299	12	2
Dawson Road.	"	"	63	7,467	10	426	42	...
Dorion .....	"	"	4	639	...	...	6	9
Gillies .....	"	"	8	1,274	...	...	7	4
Gorham.....	"	"	47	6,808	14	1,594½	45	15
Lybster .....	"	"	18	2,624	1	49	14	3
Marks.....	"	"	9	1,451	2	10½	7	5

## Appendix No. 13.—Continued.

Township.	District or County.	Agent.	No. of persons located.	No. of acres located.	No. of purchasers.	No. of acres sold.	No. of lots resumed.	No. of patents issued.
McGregor ....	Thunder Bay.	W. A. Burrows, Port Arthur	37	5,800	6	494	31	....
McIntyre ....	"	"	1	160	2	63	....	3
O'Connor....	"	"	8	1,288	2	161½	9	10
Oliver.....	"	"	6	966	....	....	5	4
Paipoonge, N R	"	"	....	....	....	....	....	4
" S R	"	"	5	500	2	5	2	9
Pardee.....	"	"	2	243	....	....	....	8
Pearson.....	"	"	43	6,845	1	120	13	2
Scoble.....	"	"	22	3,444	2	112½	10	3
Strange.....	"	"	9	1,135	2	163	11	12
Ware .....	"	"	79	12,138	14	1,355½	46	9
Atwood .. .	Rainy River..	William Cameron, Stratton..	....	....	....	....	....	....
Blue .....	"	"	14	1,842	8	214½	11	4
Curran....	"	"	1	161	....	....	....	....
Dewart .....	"	"	4	675	....	....	1	1
Dilke .....	"	"	1	162	1	2	1	....
Morley .....	"	"	5	645	5	88½	5	2
Morson .....	"	"	37	5,692	26	1,258½	29	....
McCrosson ..	"	"	15	1,937	9	577	10	5
Nelles.....	"	"	8	1,124	5	250	7	2
Pattullo.....	"	"	9	1,116	3	95	3	7
Pratt .....	"	"	11	1,776	7	363	6	3
Rosebery ..	"	"	....	....	....	....	....	1
Shenston....	"	"	....	....	6	152	....	4
Sifton .....	"	"	26	4,194	15	648	15	6
Spohn .....	"	"	8	1,409	4	123½	4	7
Sutherland...	"	"	18	2,861	3	98	14	9
Tait .....	"	"	18	2,487	6	251	16	4
Tovell .....	"	"	15	2,312	8	461	12	4
Worthington..	"	"	1	112	1	16	1	1
Aylsworth ...	Rainy River .	Alex. McFayden, Emo .....	1	40	....	....	....	3
Barwick .....	"	"	9	1,375	2	59½	8	5
Burriss .....	"	"	4	672	3	61½	3	5
Carpenter....	"	"	7	1,083	....	....	7	4
Crozier.....	"	"	12	1,930	1	79½	12	5
Dance.....	"	"	2	326	....	....	3	2
Devlin .....	"	"	9	1,281	3	59½	8	8
Dobie .....	"	"	1	160	....	....	1	5
Fleming .....	"	"	11	1,639	2	36½	8	4
Kingsford ...	"	"	....	....	1	40	....	1
Lash.....	"	"	6	991	4	525	5	2
Mather .....	"	"	17	2,799	1	39½	18	1
Miscampbell .	"	"	18	2,901	4	322	21	12
Potts .....	"	"	5	798	3	199	6	1
Richardson...	"	"	....	....	....	....	....	1
Roddick.....	"	"	....	....	....	....	....	....
Woodyatt ....	"	"	....	....	....	....	....	....
Aubrey ....	Kenora .....	R. H. Pronger, Dryden .....	8	1,173	....	....	7	3
Eton.....	"	"	11	1,666	....	....	8	5
Langton .....	"	"	5	768	....	....	....	....
Melgund .....	"	"	4	618	....	....	7	8
Mutrie.....	"	"	18	2,570	2	80½	9	8
Rugby .....	"	"	....	....	....	....	....	7
Sanford.....	"	"	10	1,277	1	2	6	11
Southworth..	"	"	10	1,363	....	....	5	10
Temple.....	"	"	8	1,353	....	....	5	1

## Appendix No. 13.—Concluded.

Township.	District or County.	Agent.	No. of persons located.	No of acres located.	No. of purchasers.	No. of acres sold.	No. of lots resumed.	No. of patents issued.
Van Horne ...	Kenora .....	R. H. Pronger, Dryden... ..	2	168	2	190	3	15
Wabigoon ....	"	"	26	3,979	4	312	25	1
Wainwright ..	"	"	8	1,269	...	...	6	6
Zealand .....	"	"	22	3,059	3	60	14	8
Melick .....	Kenora .....	W. L. Spry, Kenora.....	14	2,208	1	53	41	2
Pellatt .....	"	"	15	2,032	6	264	13	5
Blezard .....	Sudbury.....	J. A. Lemieux, Blezard	4	465	5	10	1	10
Capreol .....	"	" Valley	10	1,684	4	1,042	5	3
Hanmer .....	"	"	8	1,138	1	81	2	2
Lumsden .....	"	"	6	683	...	...	1	4
Balfour .....	Sudbury .....	J. K. MacLennan, Sudbury ..	3	473	1	160	1	4
Broder .....	"	"	12	1,503	2	311	2	5
Chapleau .....	"	"	...	...	...	...	...	...
Dill .....	"	"	4	557	1	152	1	1
Garson .....	"	"	14	2,014	3	173	5	3
Morgan (pt) ..	"	"	2	241	...	...	...	1
Neelon .....	"	"	1	161	...	...	...	4
Rayside .....	"	"	1	82	...	...	...	2
Appelby .....	Sudbury .....	Emile Langlois, Warren.....	5	804	1	8½	2	2
Casimir .....	"	"	...	...	...	...	...	6
Dunnet .....	"	"	4	642	1	1½	...	2
Hagar .....	"	"	8	1,268	...	...	3	2
Jennings .....	"	"	4	510	2	2	...	3
Kirkpatrick ..	Nipissing ...	"	4	565	1	3	1	4
Ratter .....	Sudbury .....	"	3	484	...	...	...	1
Caldwell .....	Nipissing ....	J. A. Philion, Sturgeon Falls.	9	1,239	1	33	...	9
Cosby .....	Sudbury .....	"	4	636	1	2	1	5
Grant .....	Nipissing ....	"	7	1,117	1	5	5	...
Macpherson ..	"	"	8	1,178	...	...	...	8
Martland .....	Sudbury .....	"	10	1,570	1	3	1	4
Springer .....	Nipissing ....	"	3	340	...	...	...	2
Abinger .....	Lennox and Addington	Charles Both, Denbigh .....	...	...	...	...	1	...
Canonto, S....	Frontenac....	"	...	...	...	...	...	...
" N....	"	"	...	...	...	...	...	...
Clarendon .....	"	"	1	99	...	...	1	3
Denbigh.. .	Lennox and Addington	"	1	200	...	...	2	2
Miller (pt.)...	Frontenac....	"	4	647	...	...	1	...
Palmerston (pt.)	"	"	...	...	...	...	1	...
McClintock....	Muskoka .....	Unattached .....	3	450	3	77	...	5
Airy .....	Nipissing ....	"	1	202	1	99	1	...
Finlayson .....	"	"	...	...	1	73	...	1
Murchison .....	"	"	1	101	...	...	1	...
Sabine .....	"	"	5	708	3	300	3	4
			1575	221,255	418	18,017	1020	828

W. C. CAIN,  
Clerk in Charge.

AUBREY WHITE,  
Deputy Minister.

*Appendix No. 14.*

Statement of Municipal Surveys for which instructions issued during the 12 months ending October 31st, 1913.

No.	Name of Surveyor.	No.	Date of Instructions.	Description of Survey.
1	A. S. Campbell	687	Feb. 18th, 1913.	To survey the line between concessions 7 and 8 from lots 9 to 13, in the township of Hinchinbrooke, or as much farther on each side as an original post can be found.
2	Wilbert S. Gibson .....	688	Mar. 19th, 1913	To survey the allowance for road between the 1st and 2nd ranges, Credit Indian Reserve, south of Dundas St., township of Toronto, from the northwest angle of lot No. 8, 1st range, across lots Nos. 9, 10, 11, 12, 13 and 14 in the 1st range, and lots Nos. 6, 9 and 10 in the 2nd range, Credit Indian Reserve, and thence along the road allowance between the 2nd range, Credit Indian Reserve, and the 2nd concession of Toronto township south of Dundas St., being across part of lot 22, lot 23, lot 24 and lot 25 in the 2nd concession south of Dundas Street to the westerly limit of said lot 25, being the easterly limit of the allowance for road between lots Nos. 25 and 26, known as the "Lorne Park Road," and as regards the 2nd range on the northerly side of said road allowance, being across parts of lots No. 10, lots 11 and 12, and part of lot 13 in the 2nd range, Credit Indian Reserve, and to define said allowance for road by permanent stone or iron monuments planted on each side thereof.

GEORGE B. KIRKPATRICK,  
Director of Surveys.

AUBREY WHITE,  
Deputy Minister of Lands and Forests.



*Appendix No. 15.*

Statement of Municipal Surveys confirmed during the 12 months ending October 31st, 1913.

No.	Name of Surveyor.	No.	Date of Instructions.	Description of Survey.	Date when confirmed, under R.S.O. 1897, Chap. 181, secs. 10-15 inclusive.
1.	J. J. McKay, Tyrrell & McKay..	680a	July 27th, 1910	To survey certain concessions, road allowances, etc., formerly in the township of Barton, now in the city of Hamilton, as follows:—Barton St. from Sherman Ave. to the allowance for road between lots Nos. 2 and 3 of the township of Barton now in the city of Hamilton. Main St. from Sherman Ave. to Ottawa St. The allowance for road between the 3rd and 4th concessions of Barton now in the city of Hamilton from Ottawa St. westerly to the city limits. Sherman Ave. from the brow of the mountain northerly to the base line. Trolley St. from the brow of the mountain northerly to Burlington Bay. Ottawa St. from the brow of the mountain northerly to Burlington Bay. Allowance for road between lots 2 and 3 from the city of Hamilton Water Works pipe line to Barton St., and to plant durable monuments at the front and rear of the said portions of the concessions and allowances for road between lots in the city of Hamilton, and at the front and rear angles of the lots therein, also to plant durable monuments at the front and rear of the following portions of concessions and allowances for road between lots in the city of Hamilton, and at the front and rear angles of the lots therein:—From the eastern limit of Lakeview Ave. to the head of the Strongman Mountain Road. From Bay St. to allowance for road between lots 20 and 21, known as Paradise Road. Paradise Road from Aberdeen Ave. to Marsh known as Coot's Paradise.	Aug. 6, 1913
2.	A. S. Campbell. ....	687	Feb. 18th, 1913.	To survey the line between concessions 7 and 8 from lots 9 to 13 in the township of Hinchinbrooke, or as much farther on each side as an original post can be found.	Oct. 22, 1913

*Appendix No. 15.—Continued.*

Statement of Municipal Surveys confirmed during the 12 months ending October 31st, 1913.

No.	Name of Surveyor.	No.	Date of Instructions.	Description of Survey.	Date when confirmed, under R.S.O. 1897, Chap. 181, secs. 10-15 inclusive.
3	J. H. Moore ....	628	Sept. 14th, 1900	To survey the boundary line between the townships of Montague and Beckwith, in the county of Lanark, and to plant stone or other durable monuments on each side of the road allowance in such positions as shall define the true boundary between said townships.	Dec.14, 1912

GEORGE B. KIRKPATRICK,  
Director of Surveys.AUBREY WHITE,  
Deputy Minister of Lands and Forests.

*Appendix No. 16.*

Statement of Crown Surveys in progress during the 12 months ending October 31st, 1913.

No.	Date of Instructions.	Name of Surveyor.	Description of Survey.	Amount Paid.
1	July 4, 1912..	Patterson & Bryne	Survey of Township of Drayton, District of Kenora .....	5,000 00
			Survey of part Township of Mattawan, District of Thunder Bay .....	
2	July 15, 1913.	J. R. Allen .....	Survey of Township of Stirling, District of Thunder Bay .....	2,500 00
3	July 7, 1913.	David Beatty ...	Survey of Township of Lowther, District of Algoma .....	4,300 00
4	June 30, 1913.	H. J. Beatty ....	Survey of Township of Schofield, District of Algoma .....	4,000 00
5	July 10, 1913.	J. K. Benner ....	Survey of Timber Berths in the District of Thunder Bay .....	3,000 00
6	July 19, 1913.	J. S. Dobie .....	Survey of Township outlines, Districts of Sudbury and Algoma .....	3,000 00
7	July 2, 1913.	J. W. Fitzgerald.	Survey of Township of Caithness, District of Algoma .....	3,500 00
8	July 4, 1913.	C. H. Fullerton..	Survey of Township of O'Brien, District of Timiskaming .....	3,000 00
9	July 3, 1913.	J. R. Gill .....	Survey of Township of Talbot, District of Algoma .....	3,000 00
10	June 30, 1913.	Lang & Ross ....	Survey of Township of Orkney, District of Algoma .....	3,500 00
11	July 9, 1913.	T. J. Patten .....	Survey of Township of Shetland, District of Algoma .....	2,800 00
12	July 12, 1913.	Speight & Van Nostrand .....	Survey of Township of Ebbs, District of Algoma .....	3,500 00
13	July 19, 1913.	Sutcliffe & Neelands .....	Survey of outlines of townships, District of Kenora .....	1,000 00
14	Aug. 14, 1913.	Sutcliffe & Neelands .....	Survey of Township of Malachi, District of Kenora .....	2,000 00
15	Apr. 18, 1913.	A. L. Russell ...	Survey of land adjoining and north of Townships of Ware, Gorham and McGregor, District of Thunder Bay .....	2,900 00
16	July 17, 1913.	McAuslan & Anderson .....	Survey outlines, District of Kenora .....	2,500 00
17		James Hutcheon .	Inspection of Surveys .....	500 00
				50,000 00

GEORGE B. KIRKPATRICK,  
Director of Surveys.

AUBREY WHITE,  
Deputy Minister of Lands and Forests.

*Appendix No. 17.*

Statement of Crown Lands surveyed, completed and closed during the 12 months ending  
October 31st, 1913.

No.	Date of Instructions.	Name of Surveyor.	Description of Survey.	Amount paid.		No. of Acres.
				\$	c	
1	May 14, 1912	Lang & Ross ....	Survey of township outlines, District of Algoma .....	621	39	
2	May 20, 1912	Speight & Van Nostrand .....	Survey of township outlines, District of Algoma and township of Mulloy .....	2,193	90	51,849
3	May 20, 1912	H. J. Beatty ....	Survey of township outlines, District of Algoma .....	764	23	
4	May 21, 1912	Andrew Bell ....	Survey of township of Sargeant, District of Timiskaming .....	1,285	17	36,851
5	May 22, 1912	J. Hutcheon ....	Survey of township of Shackleton, District of Timiskaming .....	942	00	54,420
6	May 21, 1912	C. H. Fullerton ..	Survey of township of Stoddart, District of Algoma .....	1,417	90	52,017
7	May 21, 1912	J. W. Pierce ....	Survey outlines of townships, District of Algoma .....	890	52	
8	May 27, 1912	D. J. Gillon ....	Survey of township of Mathieu, District of Rainy River.....	385	90	26 859
9	July 9, 1912	J. W. Fitzgerald .	Survey of township outlines, District of Sudbury .....	277	18	
10	June 10, 1912	T. J. Patten .....	Survey of township outlines, District of Algoma .....	1,073	55	
11	May 29, 1912	H. O. Dempster ..	Survey of part of the township of Nansen, District of Timiskaming	1,690	77	34,907
12	July 17, 1912	McAuslan & Anderson .....	Survey of township of Way, District of Algoma .....	1,490	40	51,534
13	June 5, 1912	G. P. Angus .....	Survey of part of township of Hanlan, District of Algoma .....	1,657	50	34,575
14	June 13, 1912	Cavana & Watson	Survey of township outlines, District of Algoma .....	880	00	
15	June 17, 1912	E. D. Bolton ....	Survey of Dawson road lots, District of Thunder Bay .....	234	65	
16	July 17, 1912	A. S. Code .....	Survey of township outlines, and township of Studholme, District of Algoma .....	685	50	51,855
17	June 24, 1912	Coltham & Coltham .....	Survey of part of township of Casgrain, District of Algoma .....	660	90	34,609
18	Oct. 10, 1912	C. H. Fullerton ..	Survey of timber berths in township of Mulligan, District of Timiskaming .....	370	28	
19	June 10, 1912	C. E. Fitton ....	Inspection of Surveys, 1912,	1,685	46	
20	Nov. 19, 1912 Dec. 4, 1912 Jan. 23, 1913 Feb. 17, 1913	E. Seager .....	Survey of timber berths in District of Kenora .....	4,049	07	
21	Jan. 22, 1913	Speight & Van Nostrand .....	Survey islands in Cache Lake, in Algonquin Park .....	535	48	
22	Nov. 25, 1912	McAuslan & Anderson .....	Survey Timber Berth A, District of Nipissing .....	115	25	
23	June 10, 1912	D. Beatty .....	Survey part of township south of Henvey Indian Reserve, District of Parry Sound .....	708	90	
24	Nov. 21, 1912	A. Loughheed ....	Survey timber berths in District of Thunder Bay .....	2,005	00	
25	Nov. 29, 1912	E. R. Bingham ..	Survey parts township of Blake and Crooks, District of Thunder Bay .....	2,696	45	



*Appendix No. 17.—Continued.*

Statement of Crown Lands surveyed, completed and closed during the 12 months ending  
October 31st, 1913.—Continued.

No.	Date of Instructions.	Name of Surveyor.	Description of Survey.	Amount paid.	No. of Acres.
				\$ c.	
26	June 17, 1912	E. D. Bolton ...	Survey Dawson road lots, District of Thunder Bay .....	260 00	
27	Dec. 2, 1912	J. F. Whitson ...	Survey addition to town plot of Hearst .....	47 10	
28	May 29, 1912	J. W. Fitzgerald .	Survey at Hay Bay, township of Fredericksburg .....	427 60	
29	July 19, 1912	David Beatty ...	Survey township of Fauquier, District of Timiskaming .....	1,086 10	34,861
30	Apr. 28, 1913	J. S. Dobie .....	Making report on land adjacent to line of Lake Huron and Northern Ontario Railway .....	125 00	
31	Oct. 18, 1913	McAuslan & Anderson .....	Survey of lot 34, concession 16 township of Ferris .....	10 00	
			Maurice Derouard, draughtsman on DeMorest & Stull's survey of islands in Lake of the Woods...	166 35	
			Maurice Derouard, draughtsman on DeMorest & Stull's survey of islands in Lake of the Woods...	56 35	
			Maurice Derouard, draughtsman on DeMorest & Stull's survey of islands in Lake of the Woods...	150 00	
			Geo. Blair, inspecting land north of Dorion township, District of Thunder Bay .....	55 00	
			Rice Lewis & Son, iron posts .....	315 00	
			E. H. Harcourt & Co., lithographing .....	6,373 00	
			C. Tarling & Co., mounting maps .....	643 21	
			Wm. Margach, on account of survey of Lake of the Woods .....	55 45	
			J. W. Stone, storage of launch .....	36 00	
				39,123 51	464,337

GEORGE B. KIRKPATRICK,  
Director of Surveys.

AUBREY WHITE,  
Deputy Minister of Lands and Forests.

*Appendix No. 18.*

## SURVEY OF BASE AND MERIDIAN LINES, DISTRICT OF ALGOMA AND THUNDER BAY.

TORONTO, December 30th, 1912.

SIR,—We have the honour to submit the following report on the survey of certain township outlines in the Districts of Algoma and Thunder Bay made by us during the past summer under instructions from your Department, dated the 20th of May, 1912, with accompanying projected maps.

Upon receipt of the instructions, we immediately proceeded to make arrangements for supplies. With six men from Toronto and vicinity we left for Cochrane, the terminal of the Timiskaming and Northern Ontario Railway on 4th June, and upon our arrival were joined by ten men from Chapleau and Heron Bay. Three additional men joined the party after the work had been commenced, and this was the maximum force used during the season's operations.

The work was in charge of T. B. Speight, O.L.S., assisted by John van Nostrand, O.L.S., and N. A. Burwash, O.L.S.

From Cochrane we proceeded to Mileage 44, District E, on the National Transcontinental Railway.

The instructions give the point of commencement as the north-east angle of the township of Boyce, but as the survey was made in conjunction with the subdivision of the township of Mulloy, the last-mentioned township being surveyed under instructions from your Department, of even date, it was found necessary to begin the work on the lines adjoining the township of Mulloy in order to avoid the extra moving of supplies and camp outfit.

A beginning was made on the 13th June at the south-west corner of the township of Mulloy and the boundary between the townships of Shuel and Mulloy was run north for a distance of nine miles, crossing the centre line of the right of way of the National Transcontinental Railway, as constructed on the ground, at four miles seventy-one chains and eleven links. This boundary was completed on 18th June and the party then proceeded with the subdivision of the township of Mulloy.

On 5th July one half of the party proceeded to the south-west corner of the township of Mulloy and ran the boundary between the townships of McCoig and Kohler, nine miles south. Upon the completion of this line the two parties joined in the township of Mulloy.

On 16th July the combined parties proceeded to mileage fifty-two of District E., on the National Transcontinental Railway, and on the following day began to run the boundary between the townships of Burrell and Shuel east from the north-east corner of the township of Boyce.

This line was completed on the 26th July and was run a full nine miles. It intersected the centre line of the right of way of the National Transcontinental Railway, as constructed on the ground, at one mile, fifty-one chains and eighty-two links east of the north-east corner of the township of Boyce. It was intersected by the boundary between the townships of Shuel and Mulloy at one chain and eleven links west of its eastern extremity and intersected the last-mentioned boundary at nine miles and seventy-four links.

The east boundary of the township of Burrell was then run north from the end of the last mentioned line, *i.e.*, from a point one chain and eleven links east of the north-west corner of the township of Mulloy.

One half of the party ran north on this line, the remainder continuing the survey of the township of Mulloy.

The north boundary of the township of Mulloy was run in conjunction with the sub-division of the township. It was run a full nine miles from the south-east corner of the township of Burrell, and was intersected by the east boundary of the township of Mulloy, at eight miles, seventy-six chains and seventy-eight links.

On 26th August a beginning was made at the north-east corner of the township of Boyce, and the boundary between the townships of Bicknell and Burrell was run nine miles north. It intersected the centre line of the right of way of the National Transcontinental Railway at seventy-three chains and ninety-three links north of the north-east corner of the township of Boyce.

The north boundary of the township of Burrell was then run nine miles east and was intersected by the east boundary of the township of Burrell, one chain and thirty-three links from its eastern extremity, and it intersected the last mentioned boundary at eight miles, seventy-nine chains and eighty-six links.

Returning to the north-west corner of the township of Burrell, the north boundary of the township of Bicknell was run west from this point to the boundary between the districts of Algoma and Thunder Bay, a distance of ten miles, sixty-three chains and thirty-nine links.

The intersection of these lines was four chains and one link south of Mile Post CIII, planted by A. Niven, O.L.S., in 1907.

From the above intersection the north boundary of the township of Henderson, in the District of Thunder Bay, was run nine miles west.

From a point on this line eight miles, seventy-eight chains and twelve links west of the boundary between the Districts of Algoma and Thunder Bay, that distance making allowance for the convergence of meridians, the west boundary of the township of Henderson was run south to a base line run by T. B. Speight, O.L.S., in 1908.

It was intersected by this base line at nine miles one chain and fifty-two links, and intersected the base line at nine miles exactly. It was also intersected by the centre line of the right of way of the National Transcontinental Railway at three miles, twenty-eight chains and thirty-nine links, south of the north-west corner of the township of Henderson.

All meridians were run due north (or south) astronomically, and the base lines were run due west (or east) on nine mile chords of parallels of latitude. Wooden posts of the most durable material within a reasonable distance of the line, were planted at intervals of one and a half miles, and, in addition, iron posts, one and seven-eighths inches in diameter, were planted alongside the wooden posts, at all intersections of township boundaries, except at the south-east corner of the township of Burrell, and on productions of lines beyond intersections.

On each wooden and iron post the number of the mile it represented was carefully marked on the side nearest the initial point of the line, also on the wooden and iron posts situated at township corners, the name of the township or townships, was marked.

In all cases where wooden and iron posts are planted side by side, the iron post indicates the intended corner.

All lines were well opened out and properly blazed.

Frequent astronomic observations, records of a number of which are appended, were taken for the purpose of verifying the course of the lines run. The magnetic variation was frequently noted, the average declination being 4 degrees west.



The country embraced by this survey has a total depth of twenty-seven miles, north and south, and a total breadth of thirty-seven and three-quarters miles, east and west.

#### SOIL.

Except for a small area of gravel on the north boundary of the township of Mulloy, the soil is clay, containing a small percentage of gravel in most places, and in a few small areas boulders occur. Gravel and sand deposits have been discovered and used in the construction of the National Transcontinental Railway, sidings having been put in at the townships of Shuel and Bicknell. Generally speaking the country will be excellent agricultural land when cleared and drained.

#### TIMBER.

The greater part of the timber on the west boundary of the townships of McCoig and Mulloy, the north boundary of the township of Mulloy and the easterly six miles of the north boundary of the township of Burrell, is burned, the timber being dead and in a great many places still standing, the second growth not having advanced very far.

On the remainder of the lines the timber is the average spruce, poplar and tamarac of the clay belt, with occasional small cedars and a few white birch and balsam.

On the westerly half of the north boundary of the township of Henderson, and on the south half of the west boundary of that township, the timber is second growth about thirty years old and is of very little value.

In the river valleys occasional small areas of spruce of fair size and quality were met with, and many ties for use on the railway have been taken out.

As mentioned above, canoeable streams occur about every ten to fifteen miles, east and west, running to the north-east. They are shallow and swift with gravel bottoms. With the exception of two cases on the Bad River, no falls were seen, although there are small rapids and riffles about every quarter of a mile. Lakes were conspicuous by their rarity.

#### MINERALS.

No indications of economic mineral were noticed and the only outcroppings of rock seen were pegmatite and a slightly schistose green rock which occur on the west boundary of the township of Mulloy, near the IM and VIM posts, also certain granite outcroppings, described in detail in our report upon that township.

#### GAME.

There are a few moose in this district. On most of the small streams fresh beaver cuttings were seen. In the rivers and small streams partridge, prairie chicken and rabbits are fairly numerous. The prairie chicken were found chiefly in the open muskegs and burnt low lying areas. Brook trout and pickerel were fairly abundant and some good pike were caught in the Pegatchewan River.



## GENERAL DESCRIPTION.

Generally speaking the surface is level and in places undulating. The main streams which drain the area are the Pegatchewan, Bad, Trout, Dog and Flint Rivers.

The river valleys are narrow and range from ten to fifty feet below the general level of the surrounding country. Much of the land appears wet, but except on the boundary between the townships of Bicknell and Burrell, where from Mileage 5 to 8, a large muskeg occurs, we found nowhere more than eighteen inches of moss and peat, and on the higher ground not more than three inches. In our estimation sixty-five to seventy per cent. of the land embraced by the survey may be classed as good farm land, and when access by means of the railway is completed settlement will begin. The whole of this district lies within the clay belt.

Canoeable rivers having a few small tributaries occur about every ten to fifteen miles east and west, and flow in a north-easterly direction. Few lakes were seen.

The southern and eastern part of the tract surveyed was burned about ten to fifteen years ago, and nearly all the timber destroyed. On the remainder of the tract the timber is the average timber found on the clay belt.

Accompanying this report are a plan and field notes of the entire survey, also accounts in triplicate.

We have the honour to be, Sir,

Your obedient servants,

(Sgd.) SPEIGHT & VAN NOSTRAND,

*Ontario Land Surveyors.*

The Honourable the Minister of Lands, Forests & Mines,  
Toronto, Ontario.

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*Appendix No. 19.*

SURVEY OF TOWNSHIP OUTLINES, DISTRICT OF ALGOMA.

ORILLIA, December 12th, 1912.

SIR,—With the object of carrying out your instructions for the survey of certain township outlines in the District of Algoma, bearing date the 13th of June, 1912, our party left Missinaibi with the necessary equipment for the work on the 25th of July following. The route followed was up the east arm of Dog Lake; thence across a short portage into Crooked Lake, where another short portage leads into Missinaibi Lake; and thence to the Missinaibi River, down which we travelled to a point where this last stream crosses the meridian run by O.L.S. Speight in 1910, between XVIM. and XVII. M. posts on that boundary. Such supplies as were required for that purpose were then taken by canoe up

the small creek entering the main river near this point, and which we found to be navigable with some difficulty, to near the crossing of our first base line commencing at the post at XV. M. on above meridian. The survey of the first base line was commenced from the above post. The main part of the supplies were taken on down the river to the portage leading from the Missinaibi to the Fire River at a point about three-quarters of a mile above the crossing of our second base line run from XXIV. M. Where this portage leaves the river the country has been burned over for some distance back and the trail was blocked with heavy windfall. We found it necessary to cut this portage out in order to transport canoes and supplies across to the Fire River. This portage is about two and a quarter miles in length, and with the exception of the first part, where there is a steep rise for fifteen chains or so, is comparatively level. The latter river affords a good canoe route with few obstructions as far as followed, and also furnishes abundant exercise in making headway against its stiff current. At about a mile west of our first meridian the Fire River is joined by a fair-sized creek known as Pajogwin Creek, which flows from a lake of the same name. The latter creek was used for transport for a distance of about one and a half miles north of our second base line where a portage two miles long leads to the southerly end of the above lake. This lake is crossed near its northerly end by the Canadian Northern Railway, and the creek entering it from the west is followed closely by that line. From this lake westerly to Lake Minnapooka it is mostly a case of portage, as the creek is shallow and rocky. From the westerly arm of the narrow recurved lake known as Minnapooka and at its northerly extremity a portage route leads northerly to a small lake known as Bommerang Lake, and thence westerly through a series of small lakes or ponds into Lake Innokguameguea, a long narrow lake lying nearly north and south and debouching north through a small river of the same name. Travelling south on this last mentioned lake, which is crossed by our third base line near VI. M. on the south boundary of Walls, a portage route leads across to the Oba River and thence into Oba Lake and Loch Alsh, and from the latter there is a portage into a creek flowing into the west arm of Dog Lake. This route was followed on our return trip after completing the survey bringing us back to Missinaibi from the west.

Our first base line was commenced from the point marked by iron and spruce posts at XVM. on the meridian run by O.L.S. Speight in 1910, and run due west astronomically for a distance of nine miles. From the latter point our first meridian was turned due north and run to the intersection with our second base line and thence continued for nine miles north of the latter base and our third base line turned due west and run through to the meridian run by O.L.S. Patten in the current season. Our second base line was run due west from the post planted by O.L.S. Speight in 1910 and marked 47 chains on the east bank of the Missinaibi River, said post being planted on a line run due west from XXIVM. on the meridian by O.L.S. Speight in 1910, and continued west a distance of nine miles from the intersection of our first meridian and from the last mentioned point our second meridian was turned due north. Our fourth base line was turned due west from a point on our second meridian distant eighteen miles north of our second base line and run to intersect the meridian run by O.L.S. Speight in 1910 continued south by O.L.S. Patten during the current season and forming the westerly boundary of the township of Walls. On meridian and base lines so run, wooden posts six inches square were planted at intervals of one and one-half miles dating from the initial points at the intersections of base and

meridian to the south or east and were marked with the mileage from such initial points. At the intersection of base and meridian lines forming the township corners, iron posts one and one-quarter inches in diameter were planted beside the wooden posts and marked with the township names on the side facing diagonally into the township or townships in question. When the point where such post should be planted fell in a lake or other inaccessible place, the post was planted at the nearest available point on the line and marked with its correct chainage from the initial point. With the exception of the few instances where these were not available, bearing trees were marked to witness the posts so planted and their relative positions recorded in the field notes.

The country traversed by the survey occupies the dim borderland between the clay belt proper and the rock section to the south, and in its general features well reflects its composite character. While there are few hills that attain a height of more than twenty-five feet or thirty feet and these seldom rise with any great abruptness, the country generally presents a decidedly rolling surface, drift covered throughout the greater part of its area and with occasional rock outcrops and rocky sections. The Missinaibi River flows north through the easterly part of the township of Hayward, crossing and recrossing the easterly boundary, and nowhere in its course greatly over a mile therefrom. This stream, forming one of the main branches of the Moose River is too well known to need an extended description and the abundant water powers along its course will doubtless make it still more widely known in the future. Aside from the Missinaibi the most important stream met with is its tributary the Fire River, which is crossed by our second base line between two and one-half and two and three-quarter miles west of the former river and flows for some distance nearly parallel therewith. This last stream is from a chain to a chain and a half wide with strong current and affords a good waterway for canoes. At the place where the portage from the Missinaibi River comes out there is a fall of about six feet in this river and about six chains further down stream another fall of great beauty. The latter is about twenty-five feet in height, dropping through a narrow rock gorge into a circular basin of about seven chains in diameter, from which the stream emerges through a narrow rock opening of some ten feet in width. Forming the rim of this basin the rock rises precipitately to a height of forty feet or more, the whole forming a scene that imprints itself strongly on the memory and is well worth travelling some distance to see. From the commercial standpoint this fall would permit of power development at a minimum of cost.

The country is covered with the characteristic forest growth of this latitude and surface configuration. The timber values as a whole are not relatively high; but a great deal of material in the form of spruce, poplar, balsam and jack pine could be harvested from the area which has not been visited by fire. The greater proportion of this timber would probably be found more valuable for pulpwood than for milling purposes. In the south-westerly part of Hayward, extending westerly from the Greenhill River across the westerly boundary of the township and northerly about three miles the timber is heavy and composed of jack pine, spruce, birch, and balsam, carrying a thick undergrowth of moosewood and hazel. The same character, but with the trees much more scattered, applies to the south-westerly portion of Legge. A narrow belt of jack pine in length and size to cut four tie lengths is crossed by the meridian forming the west boundary of Legge within easy hauling distance of the railway line. Cedar of commercial size is scarce. One clump running from twelve to twenty-four inches in diameter and



suitable for poles up to thirty-five feet in length was passed through on the easterly boundary of Walls near IIM., and another similar character near the north-east angle of that township. Fire has wrought much mischief through the section, its ravages being most noticeable along the second base line from the Missinaibi River to Pajogwin Creek. The whole westerly part of Walls extending from Innokguameguea Lake to the north-east angle of the township is composed of an old brule growing up with small jack pine, poplar, birch and balsam, save where the original swamps have resisted the advance of the fire. Great credit is due to the manner in which the clearing and burning of the right of way of the Canadian Northern Railway, which takes a diagonal course from south-east to north-west through the townships embraced in the survey, has been performed; the green avenues of trees, except in places which had been previously burnt over, forming a most cheerful contrast to the conditions encountered along the older lines.

From an agricultural standpoint this section is inferior and until such time as the wide area of good land included in the clay belt proper lying to the north is fully occupied it will probably be found more valuable as a constituent part of a forest reserve than for settlement purposes. The soil is mostly composed of a clay sand mixture, usually with the clay largely predominating. From this it varies from clay loam to sandy loam, with from one to six inches of black mould as a surface covering. It is generally stony and in many places boulder strewn. The parts offering the best inducements for agricultural development appear to be along the northerly part of Legge and the brule section in the westerly part of Walls. Along the Canadian Northern right of way, where it has been found necessary to make cuts in the muskeg or swamp areas, the muck surface is found to be underlaid by boulders, and this is probably true throughout the section.

To the hunter or angler this part offers abundance of sport in quest of the lordly moose, who finds it a congenial habitat, or in angling for the wary trout. The speckled trout is abundant in Fire River and we believe in some other streams of the district as well, and may be taken to a weight of at least three pounds. When the railway now under construction is completed it will offer easy access to a sporting country of high rank.

We have the honor to be, Sir,

Your obedient servants,

(Signed) CAVANA AND WATSON.

*Ontario Land Surveyors.*

The Honourable the Minister of Lands, Forests and Mines,  
Toronto, Ont.



*Appendix No. 20.*

## SURVEY OF TOWNSHIP OUTLINES, DISTRICT OF ALGOMA.

SAULT STE. MARIE, ONT., November 4th, 1912.

SIR,—We have the honor to submit the following report on the survey of outlines of certain new townships north of Hobon Junction on the Canadian Pacific Railway in the District of Algoma, made by us under instructions from your Department dated May 14th, 1912.

We arrived at Loch Alsh on the morning of May 18th, with men and supplies ready to commence and completed our work on July 10th. On the morning of May 19th we moved up Wabatongashene Lake some eight or nine miles to the place of beginning and commenced our survey late in the afternoon of the same day.

Commencing at the 144th mile post on O.L.S. Niven's base line on the shore of Wabatongashene Lake we ran due west astronomically nine miles, marking our posts in Arabic figures on the east side, "145" up to "153" planting one post at the end of each mile. At this point we connected our line with a post planted by O.L.S. Stewart as the approximate north-east angle of Township 51 by a line.

We then ran north astronomically from this 153rd mile post 24 miles and planted posts at the end of each mile until the 6th mile and north of that point at the end of each mile and a half. At the end of the 147th mile on the base line we ran due north astronomically six miles more or less, planting posts at the end of each mile and marking them on the south side in Roman numerals with the number of miles the said posts are north of the production of Niven's base line. From the end of the 6th mile on our 1st meridian we ran a line due east astronomically nine miles, planting posts at the end of each mile and a half and numbering them on the west side. From a point on our 1st meridian 15 miles north of the 153rd mile post on the production of Niven's base line, we ran our 3rd base line east astronomically to Oba Lake, and from the end of the 24th mile post on our 1st meridian we ran our 4th base line east astronomically to Oba River. From the end of the 9th mile on our 2nd base line we then ran our 2nd meridian due north astronomically 18 miles, planting posts at the end of each mile and a half. We then produced our 3rd and 4th base lines east astronomically to a distance of nine miles net east of our 2nd meridian.

At the angles of each of the townships and at the eastern ends of our 3rd and 4th base lines along side the wooden post we have planted an iron post, one and one half inches in diameter and three feet long, a tube, forged at the top, pointed at the bottom and painted red and in each case marked with the names of the adjacent townships with a cold chisel. At all crossings of the Algoma Central Railway we have tied our lines with the mileage on the railway as shown us by the Company's Engineers.

## PHYSICAL FEATURES.

The entire area which we covered with those lines south of the north end of Oba Lake was very rugged and for the most part covered very thickly with small birch and poplar. Abrupt granite hills thickly covered with large boulders and gravel, run in all directions, divided by very deep valleys. To the north of Oba Lake the country slopes to comparatively level clay land and easily drained muskegs

with rocky outcroppings here and there. In the more westerly portion of our work we encountered a great number of small lakes, but toward the east there were very few; so much so that we were unable to use our canoes at all for purposes of transportation. Wabatongashene and Oba Lakes have heretofore been surveyed by your Department, so mention of them would be superfluous. There is a chain of lakes starting near Hobon and connecting with the north end of Wabatongashene Lake. A river emptying into the north-east bay of this lake drains a chain of lakes lying to the north-east. Spruce Creek which runs into Oba Lake at the extreme north end from the east drains several large lakes lying some seven miles to the east of Oba Lake.

### SOIL.

In the valley of the Oba River only did we encounter arable land. In this section there is strong clay loam of very considerable depth. It is adaptable in every way to farming; more particularly as it requires very little clearing, as it has been swept a second time by fires within the past six years.

### TIMBER.

The timber is almost a negligible quantity. Nine-tenths of the country has been burnt over some years ago, and only along the shores of some of the lakes and in the swamps are stands of commercial timber to be found. This burnt area has grown up very thickly with white birch and poplar which to-day average about twenty feet in height. Such jack pine and cedar as there was has been largely cut within the past year for ties, trestles, etc., for the construction of the Algoma Central Railway north of Hobon. Around the shores of Wabatongashene Lake there was a considerable quantity of Jack pine averaging twelve inches in diameter, also around the lakes which the Algoma Central Railway parallels for the first twelve miles north of Hobon. In short, timber of any commercial value is so scattered and in such small quantities as to be hardly worthy of mention.

### WATERS.

The main water way is of course the Oba River, Oba Lake, and Wabatongashene Lake. These two lakes are connected at present by a monorail tramway owned by the Superior Construction Company, but previously a small stream was used on which it was necessary to make three portages. The Oba River as far north as we went is easily navigable for canoes. From the north end of Wabatongashene Lake one can reach Hobon through a series of lakes and small streams. This, however, is very difficult route at low water. By means of Spruce Creek which runs into the north end of Oba Lake it is possible to cross over to the waters of Missinabi River. On our west meridian we encountered the edge of Magpie Lake, which is the gateway to another large system of water ways. On this meridian we crossed numerous small lakes, but none of them are worthy of mention in this connection.

### FISH AND GAME.

The rivers and lakes as far as we were able to ascertain contain pickerel, pike and white fish, and in some places on the Oba River we understand there are

quantities of speckled trout. We saw signs of both moose and red deer, but we do not consider that they are very plentiful in the country. Everywhere we found partridge and rabbits in great numbers.

Accompanying this report we submit plans and field notes and account in triplicate.

We have the honor to be, Sir,

Your obedient servants,

(Signed) LANG AND ROSS,

*Ontario Land Surveyors.*

The Honorable the Minister of Lands, Forests and Mines.  
Toronto, Ont.

N.B.—The average magnetic variation for the ground covered by us was 4 deg. west.

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### *Appendix No. 21.*

#### TOWNSHIP OUTLINES, DISTRICT OF ALGOMA.

PEMBROKE, December 28th, 1912.

SIR,—I have the honor to submit the following report on the survey of certain township outlines in that portion of the District of Algoma lying between the Trout and Kapuskasing Rivers on the east and the Missinaibi River on the west, performed under instructions dated May 20th, 1912.

In pursuance of instructions I commenced my survey at the nine mile post on O.L.S. Speight's meridian line run in 1910 from the 108th mile post of O.L.S. A. Niven's base line run west from the 120th mile post of the boundary between the Districts of Nipissing and Sudbury in 1899.

From this point I ran east, astronomically, a distance of nine miles and thence south, astronomically to intersection with O.L.S. Niven's base line near the 99th mile post and also north, astronomically, a distance of 9 miles.

Continuing my first base line east, astronomically, 9 miles and again running south, astronomically, to intersection with O.L.S. Niven's base line near the 90th miles post and also north, astronomically, a distance of 9 miles.

Again continuing my first base line to intersection with O.L.S. Pierce's meridian line, run north, astronomically, from the 81st mile post of O.L.S. Niven's base line near the ninth mile post of said meridian.

From here I went down the Kapuskasing River and produced O.L.S. Speight's base line run in 1909 from the 2nd mile post of the chord begun about 60 chains east of the Kapuskasing River, to intersection with my meridian run north astronomically from near the 90th mile of O.L.S. Niven's base line, and again with O.L.S. Speight's meridian run south astronomically from his base line 27 miles north from O.L.S. Niven's base line.

Continuing my base line west, astronomically, I intersected my meridian run as aforesaid north astronomically from near the 99th mile of O.L.S. Niven's base line.



And again continuing west, astronomically, I intersected O.L.S. Speight's meridian run in 1910, from the 108th mile post of O.L.S. Niven's base line, near the 18th mile post thereof.

The above mentioned lines were well cut out and the adjacent trees blazed on three sides in the usual manner, and hewn posts were planted as shown in the notes, care being taken to plant these posts firmly; where possible a mound of stones was erected about the post, and when the point came in a lake or river the post was planted at the nearest suitable point and the proper chainage in miles, chains and links carved thereon.

Iron posts were planted as shown in the notes but were not planted at all points as instructed on account of a consignment going astray when forwarded by freighters from Chapleau, which I regret very much.

At frequent intervals throughout the survey observations on Polaris were taken for obtaining azimuth and the magnetic declination which varied between 5 degrees and 8 degrees west of the meridian was noted and entered in the field notes.

Throughout the survey the chainbearers were duly impressed with the importance of their duties and of the need of great care to obtain accuracy in their measurements.

#### NATURAL FEATURES.

The district through which my lines run seems for the most part to be rolling land with a predominance of swampy land, especially along the route of the Canadian Northern Railway, which traverses this district diagonally. North of this branch of the Canadian Northern Railway (under construction) and between the Kapuskasing River and the Missinaibi River is a belt of good agricultural land for the most part being a greyish clay loam with a light grey clay subsoil. To the south there are small portions of good land but with a good deal of stone and round boulders beneath the loam. The country around Gull Lake and from thence easterly to the Trout River is stony land interspersed with swamp and marshes. Along the Missinaibi River there is good clay land, but lighter than in the interior townships to the north and east.

Speaking generally, the three townships north of my first base line are suitable for agricultural purposes and of the balance about fifty per cent. is good land.

No evidence of economic minerals were noted.

#### TIMBER.

The northeastern portion of the district is well wooded with spruce, balsam and cedar of a size suitable for building operations, ties and pulpwood but considerable tamarac was seen in the western and southern portions, especially in the stony country.

Along the second base line and southwest to the Missinaibi River and the Canadian Northern Railway considerable good poplar, Balm of Gilead and some pine was noted. While there is abundance of timber for use of settlers and in construction, yet there is not that amount which would warrant extensive lumbering operations.



## WATER POWER.

Several good rapids and chutes were noted which would be adaptable for use in development of power, the more important being on the Kapuskasing River about six miles from Kapuskasing Lake, and again just north from Speight's base line. Some of the rapids of the Missinaibi would furnish problems in water power development.

## GAME.

Moose and caribou appear to abound in the swamp country and we saw signs of red deer in the hilly country to the south.

Muskrat, otter, beaver, marten, fisher and mink were seen occasionally; while rabbit, partridge and duck did not seem so plentiful as of late years. The rivers and lakes generally are well stocked with pike, pickerel and perch. There is splendid speckled trout fishing on Beaver River, fish up to one and one-half pounds being taken.

Accompanying this report are a plan mounted on linen, a timber plan, field notes, chainbearers' oaths and account in triplicate.

I have the honour to be,

Sir,

Your obedient servant,

(Signed) HERBERT J. BEATTY,

Ontario Land Surveyor.

The Honourable the Minister of Lands, Forests and Mines,  
Toronto, Ont.

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*Appendix No. 22.*

## SURVEY OF TOWNSHIP OUTLINES DISTRICT OF SUDBURY.

PETERBOROUGH, ONT., *January 30th, 1913.*

Sir,—I have the honour to submit the following report on the survey of Township outlines—along the Canadian Northern Railway, in the District of Sudbury performed by me, under instructions from your Department, dated July 9th, 1912.

As instructed, I commenced the survey at a point ten chains east of the south-west angle of the Township of Garvey—the south boundary line of which, I produced due west astronomically twelve miles and ten chains from the post planted on the east shore of Donneganna Lake—said post being ten chains east of the south-west angle of the Township of Garvey, which falls in Donneganna Lake. From the end of the sixth mile on this base line I ran a meridian due north astronomically eighteen miles, and from the end of the sixth, twelve and eighteen

mile on this meridian I ran base lines due east and west astronomically six miles to intersect a meridian on the east, surveyed by me in 1911, and to connect with a meridian on the west which I afterwards ran due north astronomically eighteen miles from the end of the twelfth mile on my first base line. I also produced the north boundary of the Township of St. Louis west astronomically a distance of forty-two chains and fifty-six links to intersect the west boundary of the Township of Jack, which meridian had just been surveyed by Ontario Land Surveyor, Walter Smith, my base line produced intersecting Mr. Smith's meridian one chain and seventy links north of the point at which he had established the south-west angle of the Township of Jack. All lines in connection with the above survey were well opened out—blazed—chained and posted. At each of the angles of the various townships, iron posts—one and one-half inches in diameter—three feet long and painted red, were planted; on these posts the names facing the respective townships, were cut with a cold chisel. On the meridian lines durable wooden posts six inches square were planted at the end of each mile with the number of miles said posts are distant, north of the south-east or south-west angle of the adjacent townships, cut on the south side with a scribing iron, durable posts four inches square and similarly marked with the half-mile points were also planted. On all lines running east and west durable posts six inches square were planted at the end of each mile with the number of miles said posts are distant west of the south-east or north-east angle of the adjacent townships, cut on the east side with a scribing iron—durable posts four inches square similarly marked with the half-mile posts were also planted. Going west along the south boundaries of the Townships of Westbrook and Vrooman the line passes over an undulating sandy country timbered with Banksian pine, spruce, white birch, poplar, balsam and cedar, with alder and willow underbrush and considerable windfall; spruce swamps of considerable extent are also met with all along this line. No white or red pine suitable for lumbering is seen, but much of the Banksian pine and spruce is of a considerable size, and, besides being valuable as pulpwood, would, I am sure, make a good quality of lumber. Going north along the west boundaries of the Townships of Westbrook, Champagne and Groves the character of the country is much the same as far north as Minniesinqua Lake, where it becomes rocky and broken. Along the sixth mile of the west boundary of the Township of Westbrook and first mile of the west boundary of the Township of Champagne considerable good red and white pine up to twenty-four inches in diameter is seen. Along the west boundary of the Township of Groves—east of Minniesinqua Lake a considerable area of spruce swamp is passed over, also a small patch which has just been destroyed by fire—no doubt burnt in connection with fire used for clearing the right-of-way of the Canadian Northern Railway which lies a short distance east at this point.

Going north along the west boundaries of the Townships of Vrooman, Benneweiss and St. Louis for the first two miles, the line passes over an undulating sandy country covered almost exclusively with scrubby Banksian pine, and from this point to the end of the fifth mile on the west boundary of the Township of Vrooman, the line passes over a gently undulating sandy plain almost destitute of living timber. Along the sixth mile of the west boundary of the Township of Vrooman and the first and second miles of the west boundary of the Township of Benneweiss, the character of the land is much the same but the timber has been destroyed by fire some years ago and is now replaced by small Banksian pine, poplar and white birch, known as Brulé country.

Along the third, fourth, fifth and sixth miles of the west boundary of the Township of Benneweiss, and along the whole of the west boundary of the Township of St. Louis, the country is rough and rocky, the timber consisting chiefly of Banksian pine, spruce and birch up to fifteen inches in diameter with alder and willow underbrush and heavy windfalls. Along the fourth, fifth and sixth miles of the west boundary of the Township of St. Louis some scattered white pine up to eighteen inches in diameter and of fair quality is seen.

Along the north boundaries of the Townships of Westbrook and Vrooman the land is undulating and sandy, and, with the exception of several spruce swamps which the line passes through, the timber is of the same general character as that already noted.

Along the north boundaries of the Townships of Champagne and Benneweiss the country is rolling and rocky, timbered chiefly with Banksian pine, spruce, birch, poplar and balsam; a few small swamps are also crossed on this line. Along the north boundaries of the Townships of Groves and St. Louis the country is rough and rocky the timber being much the same as that already described. On the Canadian Northern Railway steel was laid to a point about one mile north of the north boundary of the Township of Champagne at the time of survey.

The geological formation of this locality is the Huronian, no mineral of value being seen. I think I am also quite safe in saying that in the six townships outlined by me this season, there is absolutely no land fit for agriculture. I found the average magnetic variation about seven degrees west. Frequent observations for Azimuth were taken, the lines in all cases checking very closely.

Moose are very numerous in this locality, and the beaver is still active.

Accompanying this report are plans, field notes and accounts, all of which I trust will be found complete and satisfactory.

I have the honour to be,

Sir,

Your obedient servant,

(Signed) J. W. FITZGERALD,

Ontario Land Surveyor.

The Honourable the Minister of Lands, Forests and Mines,  
Toronto, Ont.

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*Appendix No. 23.*

## SURVEY OF THE TOWNSHIP OF HENVEY, DISTRICT OF PARRY SOUND.

PARRY SOUND, June 6th, 1912.

SIR,—I have the honour to report that under your instructions of May 20th to make a resurvey of the south west part of the Township of Mowat, I left Parry Sound on May 29th and arrived at Byng Inlet Mills the same evening. On the following day I hired my men and moved up the Still River about two miles, where I camped close to the north boundary of the Township of Wallbridge and the following morning observed Polaris for meridian and re-ran the north boundary of Wallbridge from the post between lots 42 and 43 eastward to side road 35-36 finding all the posts or portions of them, also the south-west angle of the Township of Mowat, where I found part of the original post in a mound of stones. On the following day (May 1st) I ran a trial northward from said south-west angle of Mowat one hundred chains without finding indications of the original boundary till within a few chains of Con. line II and III, and found that my line was one chain and ninety-five links east of the original monument marking said con. line. I found the bottom part of the post in the centre of the west boundary and centre of said con. line in pile of stones, the post for Con. II and west side of lot 35 was lying beside a mound of stones.

On May 3rd I ran the true boundary between the south-west angle of Mowat and Con. II and III on west side of said township.

There are no settlers in the Township of Mowat along the Still River. They are all west of this township in the unsurveyed land, nor is there any land along the Still River in the township worth settling on.

The object of the survey being to locate the settlers along Still River in the Township of Mowat, I did not consider it necessary to make further survey.

I herewith enclose the names of the several settlers along the Still River in the unsurveyed land between the north boundary of the Township of Wallbridge and the west boundary of the Township of Mowat, with the estimated acres of each man's clearing.

I have the honour to be,

Sir,

Your obedient servant,

(Sgd.) DAVID BEATTY,

Ontario Land Surveyor.

The Honourable, the Minister of Lands, Forests and Mines,  
Toronto, Ont.



*Appendix No. 23a.*SURVEY OF A PIECE OF LAND WEST OF MOWAT AND SOUTH OF THE HENVEY  
INLET INDIAN RESERVE.

TOWNSHIP OF HENVEY,

PARRY SOUND, July 26th, 1912.

SIR,—I have the honour to report that under your instructions I have located the several settlers on Still River and vicinity in the unsurveyed land west of the township of Mowat and north of the township of Wallbridge. I interviewed every settler who claimed a location on Still River and had improvements made, and adjusted their boundaries agreeably between them with the exception of W. Gavin (on lot 8 as shown on plan) sometimes called Bedor and commonly known as Wild Cat, who claims a part of lot 3 on the south side of Still River in what I have called Con. B, as well as a part of lot 7 extending along what is known as Little Still River, but from all the information I could get, I decided that what I have blocked out as lot 8 is all that he is entitled to and possibly a little more.

I made a careful traverse of Still River and located the posts which I planted between the several lots in both Cons. A and B therefrom as is shewn on my plan and field notes.

I ran concession lines II and III west from the west boundary of Mowat to S. R. 10/11 and said S. R. south to the Wallbridge boundary. I then ran S. R. 5/6 northward to the Indian Reserve through Cons. III, IV, V, VI and VII and ran concession lines III, and IV and V and concession line VI and VII each across the first ten lots west of Mowat. I did not run S. R. 10/11 through concessions III, IV, V and VI because entirely unfit for settlement, the country being rocky ridges timbered with scrub jack pine. The country along the Canadian Pacific Railway up to the Indian Reserve is good land for two or three lots on each side.

I have the honour to be,

Sir,

Your obedient servant,

(Sgd.) DAVID BEATTY,

Ontario Land Surveyor.

The Honourable, the Minister of Lands, Forests and Mines.

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*Appendix No. 24.*

## SURVEY OF THE TOWNSHIP OF MULLOY, DISTRICT OF ALGOMA.

TORONTO, December 30th, 1912.

SIR,—We have the honour to submit the following report on the survey of the Township of Mulloy, in the District of Algoma, made under instructions from your Department, dated the 20th day of May, 1912.

The township is crossed by the line of the National Transcontinental Railway which enters it on the east boundary at a point seven chains and ninety-four links north from the south-east corner of the township, at mileage 33, plus fifteen chains and twenty links in District E of that railway, and leaves it on the west boundary at thirty chains and sixty-one links north of the south-west corner of Lot 28, Concession VII, at mileage 43, plus thirty-one chains and ninety-three links of the said railway.

The township is bounded on the south by the unsurveyed township of McCoig; on the west by the unsurveyed township of Shuel; on the east by the unsurveyed Township of Fintry, and on the north by the unsurveyed lands of the Crown.

On the 4th of June, we left Toronto, via the Grand Trunk Railway, and Timiskaming and Northern Ontario Railway for Cochrane, and from there proceeded by construction trains on the National Transcontinental Railway, to the township.

**Work was commenced on the 18th of June.**

All lines were run with a transit and frequent astronomic observations, records of a number of which are appended, were taken to verify the courses of the lines run. The lines were well opened out and blazed.

Wooden posts of the most durable wood obtainable were planted at the points required by the instructions.

The iron posts furnished by your Department, were planted as given below; at the intersection of the centre lines of allowances for road at the north east corner of the township of Mulloy, a post one and seven-eighths inches in diameter, marked "Mulloy" on the south-west face, "Fintry" on the south-east face, and "R" on the north, south, east and west faces. Iron posts, one and one-quarter inches in diameter, were planted at the following points; at the intersection of the centre of road allowance along the east boundary, with the centre of road allowance between Concessions VI and VII; at the intersection of the centre of road allowance along the west boundary, with the centre of road allowance between Concessions VI and VII; at the intersection of the centre of road allowance along the south boundary with the centre of road allowance between Lots 12 and 13; at the intersection of the centre of road allowance along the north boundary with the centre of road allowance between Lots 12 and 13; at the intersection of the centre of road allowance between Concession VI and VII, and the centre of road allowance between Lots 12 and 13.

A traverse was made of the centre line of the right of way of the National Transcontinental Railway as constructed on the ground, and where it was used as the fronts of lots, wooden posts were planted on the edge of the right of way, and on the inner edge of the road allowances, which were laid out one chain wide along each side of the right of way.

The general level of the Bad River from its entrance of the township in Lot 28, Concession V, on the west boundary, to the lower "Fall," in Lot 15, Concession X, is forty to fifty feet below the surrounding country, and from the last mentioned point to where it crosses the north boundary in Lot 11, Concession XII, it is about thirty to thirty-five feet below the general level.

A traverse was made of the Bad River.

A traverse also was made of a small lake in Lot 14, Concession VII.

#### SOIL.

On most of the township the clay soil is intermingled with a small proportion of gravel and is of good quality, with from twelve to eighteen inches of moss and peat in the low places, and two to four inches on the higher ground.

On Lot 13, Concession XI, the beach along Bad River is gravelly and this extends into Concession XII.

On the west boundary of Lot 28, Concession 1, an outcropping of pegmatite occurs, and on the adjoining land there are a number of boulders.

On the west boundary of Lot 28, Concession XI, an out-cropping of slightly schistose green rock occurs and extends about ten chains east.

On the south boundary of Lot 18, Concession V, an out-cropping of massive grey granite occurs.

On Lot 28, Concession V, an out-cropping of rock occurs in the rapids on Bad River.

At the first fall, in Lot 19, Concession VIII, and at the second "Fall" in Lot 15, Concession X, out-croppings of compact rock occur of Huronian formation.

On the south boundary of Lot 14, Concession IX, an out-cropping of granite occurs.

#### TIMBER.

As will be seen from the accompanying timber plan, most of the township has been burnt over and the second growth in this area is still very small.

On the unburnt area, in Concession VII and VIII, lots 19 to 29, there is a large proportion of spruce and poplar ranging from six to twenty inches in diameter with a few tamarac, cedar, birch, balsam and Banksian pine. A good deal of tie and trestle timber has been cut from this area for use on the National Transcontinental Railway.

The unburnt timber area in Concessions V to XII, lots 1 to 8, on the east side of the township is similar to the above area and has not been cut over.

#### MINERALS.

No indications of economic mineral were seen.

#### GAME.

Tracks of a few moose were seen. Fresh beaver cuttings were noticed in a number of places on the small streams. In the Bad and Trout Rivers speckled trout are fairly plentiful, and below the second falls on the Bad River, pickerel are quite abundant.

## WATER POWER.

Two "falls occur on Bad River, which averages from two chains to three chains in width, and is a very shallow stream full of boulders and almost continuous small rapids. It is impassible with an empty canoe, at low water. The upper fall is situate on Lot 15, Concession VIII, and has a fall of twelve and a half feet, which could be raised to about eighteen feet by a five and a half foot dam, three hundred and fifty feet, more or less, long, across the crest. This would flood the water back to Lot 21, Concession VIII, and flood a strip five or six chains wide. The lower fall is situate on Lot 15, Concession X, and is twelve feet high, and could be raised to seventeen or eighteen feet, by a six foot dam, about one hundred and fifty feet long, across the crest of the fall. This would flood the water back about twenty chains on Lot 15, Concession IX, and flood an area about seven chains in width.

At the natural head the upper fall at low water would give 287 h.p., and the lower fall 276 h.p.

With a head raised to eighteen feet, which could be easily obtained, each fall would give 414 h.p.

At both falls the bottom is solid and the lower fall could be developed as above outlined at considerably less expense than the upper fall.

No possible storage basin of any capacity occurs in the township.

## GENERAL REMARKS.

The gently undulating surface of this township gives facilities for easy drainage by means of the Bad and Trout Rivers, and the depth of the river valleys affords opportunity for draining even the low lying lands.

Any small islands marked on Bad River are simply exposed areas of bald rock or gravel and form part of the river bed.

Those parts of the township which have been burnt over will require the minimum of effort for clearing and preparing for agriculture.

Provision seems to have been made for two railway stations within the Township of Mulloy, and this fact should prove attractive to prospective settlers.

We estimate that about sixty-five per cent. of the township may be classed as good farm land.

Accompanying this report are a general plan, a timber plan, field notes of the entire survey, also account in triplicate.

We have the honour to be,

Sir,

Your obedient servants,

(Sgd.) SPEIGHT & VAN NOSTRAND.

Ontario Land Surveyors.

The Honourable, the Minister of Lands, Forests and Mines,  
Toronto, Ont.



*Appendix No. 25.*SURVEY OF THE SOUTHERLY EIGHT CONCESSIONS OF THE TOWNSHIP OF HANLAN,  
DISTRICT OF ALGOMA.

NORTH BAY, Ont., December 10th, 1912.

SIR,—I have the honour to submit the following report on the survey of the southerly eight concessions of the Township of Hanlan, in the District of Algoma, performed under instructions from your Department, bearing date of June 5th, 1912

The survey was commenced at an iron post planted by O.L.S. Speight to mark the corner between the Townships of Hanlan, Casgrain, Kendall and Way. This is the south-east angle of the Township of Hanlan, and from this point the south boundary was run west astronomically a distance of nine miles to its intersection with the west boundary of the Township run by O.L.S. Speight, this point being 31 links south of the iron post planted by O.L.S. Speight to mark the south-west angle of the Township of Hanlan.

Posts were planted according to instructions, and the lines were run in the centre of the road allowances in every case except one. In this one case the lot line between Lots 6 and 7 was run on the easterly limit of the road allowance.

Iron posts were planted at the following points:—

1. At the intersection of the northerly limit of the road allowance along the National Transcontinental Railway with the side line between Lots 12 and 13, Concession 1, and marked "R" on the four sides.

2. At the north-west angle of Lot 28, Concession 6, and marked "R" on the north and west faces, Lot 28 on the east face, and Concession 6 on the south face.

3. At the intersection of the side line between Lots 12 and 13 with the line between Concessions 6 and 7, and marked "R" on four sides.

4. At the north east angle of Lot 1, Concession 6, and marked "R" on the east and north faces, Concession 6 on the south face and Lot 1 on the west face.

5. The iron posts planted by O.L.S. Speight at the south-east and south-west angles of the Township were marked "R" on all sides.

On the 20th of August I had the misfortune to have a piece of wood pierce my wrist; and on account of blood poisoning setting in, necessitated my coming out to North Bay. After my return to the survey on the 7th of September my wrist gave me considerable trouble and I had to be in Hospital every few days to get medical attention. On my return to North Bay on the 26th of October, it was necessary for me to go to Toronto and have an operation performed on my wrist and a large piece of wood extracted, which kept me under the doctor's care for over a month. Hence the delay in completion of survey and filing of notes. Rain also retarded the progress of the work, and owing to so many days' rain astronomical observations were few, but were taken whenever possible.

## GENERAL FEATURES.

The National Transcontinental Railway crosses Lots 13 to 28 in the south-westerly portion of the Township.

Evidence of a fire having been over the entire country about 75 years ago were seen every day.

The country in the southerly part of the Township is very level, but it becomes more or less hilly at the northerly part of the survey.

### SOIL.

On the lower ground the clay subsoil is covered with a deposit of black muck, while on the higher ground there is clay and sand.

### TIMBER.

Spruce is the prevailing timber in the flats ranging from 4 inches to 10 inches, while on the higher ground there are some larger ranging up to 20 inches diameter. Poplar and Balm of Gilead attain a large size up to 24 inches diameter. Balsam, White Birch, Tamarac and Cedar also are found up to 15 inches diameter. There are considerable areas covered thickly with small spruce and balsam up to 3 inches in diameter.

### MINERALS.

There are several out-croppings of rock, but without any indications of economic minerals.

### GAME.

Moose are quite plentiful, although no red deer were seen. Rabbits, partridge, muskrats, beaver and mink are also quite plentiful.

Accompanying this report are the field notes, plan of survey and timber plan.

I have the honor to be,

Sir,

Your obedient servant,

(Sgd.) G. P. ANGUS,  
Ontario Land Surveyor.

The Honourable, the Minister of Lands, Forests and Mines.  
Toronto, Ont.

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### *Appendix No. 26.*

#### SURVEY OF THE SOUTHERN PORTION OF THE TOWNSHIP OF CASGRAIN, DISTRICT OF ALGOMA.

AURORA, Ont., Nov. 24th, 1912.

SIR,—In pursuance with instructions bearing date June 24th, 1912, from the Honorable the Minister of Lands, Forests and Mines, to subdivide the southern portion of the Township of Casgrain in the District of Algoma, we beg to report as follows:—

With as little delay as possible we proceeded to the flourishing Town of Cochrane, the location of which requires no explanation. There we were joined by five Indians from the Golden Lake Reserve along with two chainmen and a cook which comprised our whole party. From there we proceeded by rail over the G.T.P. Railway which is still under construction to the Town of Hearst.

The Township of Casgrain is situated about two miles north of the G.T.P. near the Town of Hearst, on the Mattawishquia River, which stream affords a navigable access, although in low water the numerous rapids that occur make the trip more or less arduous. In compliance with instructions our initial point was the south-east angle of the township. This was definitely defined by the wooden post and iron bar. This point we were also informed was the north-east angle of the Township of Kendall. Furthermore we were instructed to utilize the posts planted on the northern boundary of the Township of Kendall, if we found no great discrepancy. On arriving at the scene of operations we found that the north-east angle of the Township of Kendall was four chains and seventy-eight links east of the south-east angle of the Township of Casgrain, so we were unable to utilize the posts planted by O.L.S. J. S. Dobie.

However, we subdivided the south eight concessions in the usual way, and in accordance with instructions. The existing iron bars at the angles of our township we marked in the usual way, and planted five others as are shown in the field notes.

A number of lakes along with the Mattawishquia River and a small river at the west side of the township were met with. While the lakes covered a fair area of land they were nearly all shallow, averaging only about three or four feet deep in low water. The Mattawishquia River is a navigable stream throughout the township ranging from four to five chains wide. The other streams while about one chain wide are unfit for navigation, except for about one mile where it approaches its destination.

While the presence of game was not entirely wanting, very few moose or deer were seen. Pike and pickerel were found in abundance in the rivers.

Although several large outcrops of rock were to be met with, as regards the presence of economic minerals we found no traces whatever.

The township is clothed with spruce and poplar ranging from six to fifteen inches in diameter with patches of balsam, birch and cedar. While a greater portion of this timber could only be utilized as pulp wood, some no doubt, would approach the merchantable class.

The major portion of the land is especially adapted for agricultural purposes, being a light clay loam, with in most cases, a natural drainage to the river.

Although climatic conditions are not all that could be desired, if last year was any indication, as soon as the agency of civilization approaches, agricultural pursuits should be a thriving industry.

The following iron posts were planted and marked as follows:—

At the south-easterly angle of the township a  $1\frac{3}{4}$  inch iron post marked on the north-west "Casgrain," on the north-east "Shannon," on the north IX M 50 lks. and "R" on the north, south, east and west sides.

At the south-east angle of Lot 13, Concession 1, a  $1\frac{1}{4}$  inch iron post marked "Con. 1" on the north face, "Lot XIII" on the west face and "R" on the south and east faces.

At the south-west angles of the township a  $1\frac{3}{4}$  inch iron post marked "Kendall" on the south-east face, "Casgrain" on the north-east face and "R" on the south, east, west and north faces.

At the north-east angle of Lot 1, Concession VI, a  $1\frac{1}{4}$  inch iron post marked "Con. VI" on the south face, "1" on west face and "R" on east and north faces.

At the north-east angle of Lot 13, Concession VI, a  $1\frac{1}{4}$  inch iron post marked "Lot XIII" on west face, "Con. VI" on the south face and "R" on the north and east faces.

At the north-east angle of Lot 28, Concession VI, a  $1\frac{1}{4}$  inch iron post marked "R" on the north and west faces, "Con. VI" on the south face and "XXVIII" on the east face.

At the north-east angle of Lot 13, Concession VIII, a  $1\frac{1}{4}$  inch iron post marked "XIII" on the west face, "Con. VIII" on the south face and "R" on the north and east faces.

Accompanying this report, plans, field notes and accounts, all of which are respectfully submitted.

We have the honor to be,

Sir,

Your obedient servants,

(Sgd.) COLTHAM & COLTHAM.

Ontario Land Surveyors.

The Honorable, the Minister of Lands, Forests and Mines,  
Toronto, Ont.

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*Appendix No. 27.*

SURVEY OF THE TOWNSHIP OF STODDART, DISTRICT OF ALGOMA.

NEW LISKEARD, Oct. 15th, 1912.

SIR.—In accordance with instructions dated May 21st, 1912, to survey the Township of Stoddart, in the District of Algoma, along the line of the National Transcontinental Railway, I herewith present my report.

Practically the whole of the township is good agricultural land, there are scarcely any rock exposures, and while there are what might be termed spruce swamps, these will no doubt dry out as fast as cleared of the timber, as the natural drainage of the township is excellent. There was but one muskeg met with, that being on the line between lots Nos. 24 and 25 on either side of the T.C. Ry.

The timber as a rule is light and of no material value, a good deal of it is too small for pulpwood, being of quite recent growth, but there are a few patches of spruce that run up to sixteen inches in diameter, although a considerable quantity of this has been used for bridge timber on the railway construction. Along the shores of the lakes and rivers, considerable cedar of fair size was met with.

There is quite a large area of water in this township. Lakes St. Joseph and Pewabiska are the largest bodies. The islands are few, in the former lake there are but two small islands, in the latter only four, within the limits of the township. In Fort Lake is found the largest island, there being fifty-five acres in it.

Lake Pewabiska can be easily reached from the N.T.C. Railway by boats or launches of small draught, with a little work of blasting and cleaning the channel at one point.



The streams are all very sluggish, with scarcely any perceptible current, but the water is quite pure and clear though it appears black. One exception is the Kabinagagami River, which is very swift.

Pewabiska Lake, which extends for miles beyond Stoddard Township and is dotted with islands will no doubt some day make a beautiful summer resort.

The rivers abound in fish of considerable size, particularly pike and pickerel. There may be trout, but none were seen. The season of the year may have had something to do with this. Traces of moose were often noticed. Not one of the party, however, saw a moose, although we sometimes heard them. Of the fur bearing animals muskrat were very plentiful, mink were seen and fresh traces of beaver work noted. Wolves were heard on one occasion, but not a sign of red deer was seen.

The lines of the township were all run with a transit theodolite and measured with steel band chains. The lakes and rivers were traversed partly by triangulation and partly with stadia and with micrometer, the bearings being all obtained with the transit.

Iron posts were planted in the centre of the concession road allowance between lots 12 and 13 on the south boundary of the township, between lots 12 and 13 on the line between the 6th and 7th concessions and on the north boundary of the township at the east limit of lot numbered 13. Similar posts were planted between concessions VI and VII where the same intersects the east and west boundaries of the township. These iron posts were marked as shewn in the field notes prepared of the survey of this township.

Of the land in the township, I estimate that 80 per cent. of it is arable without any artificial drainage to speak of, and 10 per cent. more can be made so with drainage, and possibly more than this.

The total acreage of the lots is .....	45,792.34	acres
The total acreage of the roads is .....	1,758.61	acres
The total acreage of water is .....	4,236.7	acres
The total acreage of islands is .....	69.25	acres
The total acreage of Ry. lands is .....	161	

Total .....

52,017.9

acres

All of which is respectfully submitted.

I have the honor to be,

Sir,

Your obedient servant,

(Sgd.) C. H. FULLERTON.

Ontario Land Surveyor.

The Honourable, the Minister of Lands, Forests and Mines,  
Province of Ontario.

*Appendix No. 28.*

## SURVEY OF THE TOWNSHIP OF STUDHOLME, DISTRICT OF ALGOMA.

ALVINSTON, Feb. 26th, 1912.

SIR,—I have the honor to submit the following report of survey of the Township of Studholme in the District of Algoma on the T.C.Ry. and Kabinagagami River made under instructions bearing date the 17th day of June, 1912.

I left Alvinston August 1st, and proceeded to Cochrane, and after arranging for supplies, canoes, men, etc., I proceeded by contractor's train to Kabinagagami River.

After observation on Polaris at E. Elongation at the East Boundary at Con. VI/VII I proceeded to subdivide the township as instructed and to run the south boundary.

This township is surveyed under the nine-mile system with the exception that the T.C.Ry. will form the boundary between Cons. VII and VIII across lots four to eight inclusive, and between Cons. IX and X across lots thirteen to eighteen inclusive, and I have laid off the lots as shown by the plan and field notes as instructed.

Commencing at the east boundary at Con. line VI and VII I ran west to the road allowance between lots six and seven, and after running south the proper distance I ran the south boundary east and west from this line, intersecting the east boundary at a point 28 links south of the post planted by Mr. T. B. Speight, O.L.S., and intersecting the west boundary at a point 40 links south of the post planted by Mr. Speight.

I then proceeded to lay off the lots in the usual way, checking the lines by observation as shewn in the field notes. Owing to the wet and cloudy weather it was rather difficult to obtain many observations, but sufficient were taken for the progress of the survey.

The survey was made with transit and the lines have been well opened out and blazed. Posts have been made of the most durable timber obtainable. In only a few cases have posts other than spruce, cedar and tamarac been planted. The posts are marked with a scribe and driven in as far as possible.

The following iron posts were planted:—

On South Boundary at the centre of road allowance between lots 12 and 13; 11¼ inch iron marked on south "R"; On north "Con 1-R"; On east "Lot XII-R"; On west "Lot XIII-R."

On Con. Line VI/VII and road allowance between lots 12 and 13, 11¼ inch iron post marked, On north, "Con. VII-R"; On south, "Con. VI-R"; On east, "Lot XII-R"; on west "Lot XIII-R."

On north boundary and road allowance lots 12 and 13, 11¼ inch iron post marked, On south "Con. XII-R"; On north "R"; On east "Lot XII-R"; On west "R."

On east boundary at road allowance between Cons. VI and VII, 11¼ inch iron post marked, On north "Con VII-R"; On south, "Con. VI-R"; On west, "Lot 1-R"; On east "R."

On west boundary on road allowance between Cons. VI and VII, 11¼ inch iron post marked, On north "Con. VII-R": On south, "Con VI-R": On east, "Lot XXVIII-R": On west "R."

There are as well 1 $\frac{3}{4}$  inch iron posts planted at the north-east and north-west angles of the township planted by Mr. Speight on the survey of boundary lines.

#### GENERAL FEATURES.

The Township of Studholme is undulating or generally level and fairly dry with the exception of the south-east quarter which is of a swampy nature, this **can**, however, be easily drained as the fall is generally good and is probably the best section of the township.

Reference might be made to the Timber Map in forming a general idea of the nature of the township; Area No. 1 is a level swampy tract with clay subsoil and muck or loam top of about four inches depth; Area No. 2 is undulating and is of a sandy clay or sandy nature with gravel in places.

Along the line lots 18/19 through concessions 7 to 10 inclusive the country is somewhat broken with deep gullies; Area No. 3 is a level belt with a sandy clay subsoil and a loam or muck top similar to Area No. 1, but this area (No. 3) has not so much swamp as Area No. 1.

Approximately seventy per cent. of the land might be termed arable, and there is very little muskeg, and from the growth of potatoes, lettuce, radishes, turnips and carrots planted along the railway line at Kabinagagami River there can be no question of the adaptability of this country for agricultural purposes, although this township does not appear to be, taken generally, as good as the land to the west and to the east. Excellent hay is seen along the line of the railway in places.

The fine quality of gravel in this township at Pit 1 and Pit 3 T.C.Ry. will be valuable for constructing roads.

Numerous lakes occur within the township, and the Kabinagagami River flows along the eastern portion. Above the 8/9 Con. road, the river is good for travel, but below this a series of rapids occurs which renders it quite unfit for canoe travel.

#### SOIL.

In general the soil is of a sandy clay nature, and should be easily workable, and possibly this soil is preferable to a stiff clay soil. Nearly all the township has a top layer from two to four inches of loam or muck.

#### TIMBER.

The timber consists of a good growth of Spruce, White Birch, Poplar, dead Tamarac, and Balsam, with a few Balm of Gilead and Cedar. The underbrush is rather thick and of alder, moose maple and hazel. The size of timber runs from four to eighteen inches, and in places twenty-four inches. Much of the Tamarac and Spruce along the railway has been made into ties and care will have to be exercised in this section in order to prevent fires spreading in the tops and brush left.

The general timber is large enough for building purposes and some good pulpwood can be cut. There are some belts of White Birch toward the centre of the township along the railway which might be used for the manufacture of charcoal and wood alcohol.

## MINERALS.

No mineral indications were found in this township. The few exposures of rock are of Huronian origin.

## WATERS.

The Kabinagagami River is a stream about  $3\frac{1}{4}$  chains wide with rather dark water, but quite wholesome. There is a fair current. The river is broken with rapids in Con. VI, where a power of 1,400 horse-power may be developed at an average flow.

At the railway in Con. VII, a power of 2,300 horse-power may be developed

In Cons. IX and X a long flat rapids occurs, but owing to the wide flats it might be difficult to develop power.

In Con. XI at a chute, about 1,400 horse-power may be developed. The Traverse Notes show the reservations I would recommend.

Constance Lake consists of a shallow body of water with a sandy bottom, and along the south, west and north portions of the shore the lake is very shallow for a considerable distance out.

The water of the numerous lakes is quite clear.

## FISH AND GAME.

Game in the vicinity of the railway is scarce. A few signs of moose were seen, but very few of bear and none of deer or caribou.

There are numerous beaver and muskrat and a few mink.

The fish consists of pike, pickerel and some brook trout, and are quite plentiful.

There are plenty of ducks, but partridges were this year rather scarce owing no doubt to the wet season.

## VARIATION OF THE MAGNETIC NEEDLE.

The magnetic variation runs from 4 degrees to  $8\frac{1}{4}$  degrees west, but generally the variation is about 6 degrees west and fairly constant.

I submit with this report.

1. Field Notes of the Survey.
2. Traverse Notes of the Waters.
3. A General Plan.
4. A Timber Plan.

All of which is respectfully submitted.

I have the honor to be,

Sir,

Your obedient servant,

(Sgd.) A. S. CODE,

O.L.S., C.E.

The Honourable, the Minister of Lands, Forests and Mines,  
Toronto, Ont.



*Appendix No. 29.*

## SURVEY OF THE TOWNSHIP OF SHACKLETON, DISTRICT OF TIMISKAMING.

GUELPH, March 22nd, 1913.

SIR,—I have the honor to submit the following report and field notes of the survey of Shackleton Township in the Timiskaming District, surveyed under instructions from your Department, dated May 22nd, 1912.

This township is on the line of the National Transcontinental Railway, about fifty miles west of Cochrane. The railway enters the township from the east between the ninth and tenth concessions and forms the line between these concessions to the side road between lots twelve and thirteen and from lots thirteen to eighteen it forms the line between concessions ten and eleven, and from lots nineteen to twenty-four the line between concessions eleven and twelve, it passes through the townsite of Alexandra and crosses the north boundary at lot number twenty-seven.

The township is laid out into lots of 150 acres each, except in those concessions fronting on the railway. The survey lines were run in the centres of the road allowances and the lot posts offset fifty links on each side of the survey line, a witness post being planted on the line opposite each lot corner. The lot posts were marked with the lot numbers on the east and west sides, and the concession number on the north or south side, and R on the side next the road allowance in the usual manner. Iron posts were planted beside the wooden posts of the points indicated on the plan.

The township is traversed from south to north by the Ground Hog River which enters it at lot 27, Con. 1 and flows north and northwesterly till in Con. 7, the main channel cuts the west boundary and forms the boundary of the township, for a short distance. In the eighth concession it takes a north-easterly course and leaves the township in the Alexandra Townsite. The river varies in width from four to eight chains and is from three to eight feet in depth and flows with a fair current. There are no rapids nor waterfalls within the township. A careful stadia survey was made of the river and plotted on a scale of ten chains to an inch.

The central part of the township is drained by Wellington Creek which enters at lot 10, Con. 1, and flows northward till it crosses the N.T.C. Ry. at lot 13, and turning westward in the eleventh concession it crosses the north boundary at lot 22.

With the natural drainage afforded by those streams the swamps in this township are comparatively small in extent, the largest swamp being along the railway in the northeast corner of the township.

Four lakes were found within the township besides the one which crosses the north boundary. Two of these are each about a mile and a quarter in length by a quarter of a mile in width, the others are comparatively small.

There are numerous rock exposures along the river and some small ridges of rock in different parts of the interior but as a whole the surface of the township is not broken and probably sixty per cent. of the land in it can be brought under cultivation without much expenditure for drainage. The soil is clay and where the land has been cleared around the old construction camps the excellent

growth of timothy and clover which has sprung up and the garden vegetables grown by the residents in Alexandra would indicate in a measure the adaptability of the country for farming.

The township contains a large amount of poplar and spruce timber with some balsam, cedar and white birch. The poplar is of good quality and runs from twelve to twenty-four inches in diameter of the stump.

There is also a considerable amount of large spruce and a great deal of a size suitable for pulpwood. Most of the large timber close to the railway and along the Ground Hog River in Cons. 9, 10, 11 and 12 has been cut for construction purposes or for railway ties.

I have the honor to be,

Sir,

Your obedient servant,

(Sgd.) JAMES HUTCHEON,

Ontario Land Surveyor.

The Honourable, the Minister of Lands, Forest and Mines,  
Toronto, Ont.

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*Appendix No. 30.*

SURVEY OF THE TOWNSHIP OF SARGEANT, DISTRICT OF TIMISKAMING.

OTTAWA, December 26th, 1912.

SIR,—I have the honor to submit the following report of our field operations during last season, on the survey of the Township of Sargeant, sixty miles east of Cochrane on the National Transcontinental Railway and north of Lake Abitibi.

On receipt of your instructions dated May 21st, 1912, we, "Mr. Andrew Bell and N. J. Slater." proceeded from Ottawa June 12th to North Bay, where we purchased our supplies. On June 14th we left for Cochrane and were obliged to remain there till June 21st, as our outfit did not come in; it having been forwarded by freight.

We left Cochrane June 21st, with seven men, for Aylen River, where we camped on the south side of tracks in old construction camp.

Saturday, June 22nd, commencing chaining and posting along railway from west boundary of township.

June 24th, we took observations on long tangent of Transcontinental Railway given as south 72 degrees 56 minutes east, and found it to be south 73 degrees 3 minutes 30 seconds east. The railway bearings had evidently been commenced from the boundary line between Ontario and Quebec and no corrections had been made for curvature. On June 25th, commenced to run side road between Lots 22 and 23, and on June 26th finished side road to north boundary.

Work went steadily on in the southern part of the township with two parties. On August 28th Mr. Bell decided to go to Cochrane, being ill, and never returned. Owing to construction going on the railway we found great difficulty in keeping men.

This township is well timbered with timber suitable for settlers' building purposes. The soil appears to be well adapted for farm purposes being mostly clay subsoil, covered with black muck, and, on the low lying land, moss. Muskeg holds the frost till late in the summer, probably July. We found it difficult to drive posts through the ice protected by a covering of moss, probably this ice accounts for cold nights during the summer season. The general opinion is that when the moss is removed the climate will alter.

The land in this township appears to be much better than that lying between it and Cochrane, also the land to the north and south of the township appears to be of similar nature to that of the township.

The following iron posts were planted at the south-east angle of the township marked on the north "CON. 1" "SARGEANT" on the east "ROAD," on the west "LOT 1": at the north east angle of Lot 1, Concession 7, marking "R" on the north and east sides, "CON. VII." "SARGEANT" on the south and "LOT 1" on the west; at the south-east angle of the township marked on the north "CON. 1" "SARGEANT" on the west "LOT XVII." and on the east "ROAD"; at the north-east angle of Lot 17, Concession 5, marked on the north "ROAD," on the east "ROAD," on the south "CON. V.," on the west "LOT XVII." "SARGEANT"; at the south-east angle of Lot 17, Concession 6, marked on the north "CON. VI.," on the west "LOT XVII." "SARGEANT," on the south and east "ROAD"; at the north-east angle of Lot 17, Concession 7, marked on the north "ROAD," on the east "ROAD," on the south "CON. VII." "SARGEANT," on the west "LOT XVII."; at the north-west angle of the township, marked on the north "ROAD," on the east "LOT XXXIV," on the south "CON. VII." "SARGEANT," on the west "ROAD," and at the south-west angle of the township marked on the north "CON. 1" "SARGENT," on the east "LOT XXXIV.," and on the west "ROAD."

On September 18th I disbanded the party and left for Cochrane, having completed the survey according to instructions and finished by traversing the Okimodasik River and tying to the Interprovincial Boundary Line.

I have the honor to be, Sir,

Your obedient servant,

(Signed) N. J. SLATER,

*Ontario Land Surveyor.*

The Honourable the Minister of Lands, Forests, and Mines,  
Toronto, Ont.

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*Appendix No. 31.*

## SURVEY OF TOWNSHIP OF FAUQUIER, DISTRICT OF TIMISKAMING.

PARRY SOUND, November 30th, 1913.

SIR,—I have the honour to report that under your instructions I surveyed the first eight concessions of the township of Fauquier, into farm lots.

I left Cochrane with my party on the 2nd of August and went into camp at Conmee Station, in the township, the same day, and commenced the survey of the township the next day by brushing out and chaining the south boundary from the south-east angle, where I found an iron and a wooden post both regularly marked and continued the survey, finishing my work the second of October.

The greater part of this township will make good farming land. Although a considerable portion of it is swampy, it appears to have good drainage. There is very little of what may be called muskeg in the township, and I only saw exposed rock on the west and south shores of Remi Lake. The soil throughout the township is clay loam.

The timber on the high ground is poplar, spruce, birch and balsam and in the swamps is principally spruce.

There are several burnt areas in the township, the most of them tracable from the Transcontinental Railway, which passes through the township entering on the east side in Concession I and passing out on the west side in Concession VI. There are several places immediately along the Transcontinental Railway where an acre or two has been cleared up, or, rather, the old logs have been cut and piled up but not burnt (all in burnt section), but the parties who did the work were not on the ground when I was making the survey. The only one who had a house was a man named "Primeau," living with his family on Lot 12, Concession III. I saw no ground under cultivation. Primeau was a section foreman on the Transcontinental Railway.

I planted an iron bar post on the centre line of the south boundary, where it is intersected by the centre line of side road 12 and 13, marked on the north, east, west, and south with "R"; also planted an iron bar post on the centre line of said side road where it intersects the south shore of Remi Lake marked with "R" on the south, east, and west sides. I also planted an iron bar at the north-west angle of Lot 29, Concession VI., and at the north-east angle of Lot 1, Concession VI., both regularly marked for the respective lots.

I did not see any indications of mineral in the township. The rock formation is granite.

Remi Lake in the north part of the township is a clear water lake with plenty of fish, pike, pickerel, and whitefish. Other and smaller lakes in the township are said to have plenty of pike.

I observed Polaris for meridian at eastern elongation on Lot 12, Concession III.; on Lot 21, Concession V., and on Lot 13, Concession VI. The magnetic variation is 6 degrees 45 minutes west.

I have the honour to be, Sir,

Your obedient servant,

(Signed) DAVID BEATTY.

The Honourable the Minister of Lands, Forests and Mines,  
Toronto, Ont.



*Appendix No. 32.*

## SURVEY OF HAY BAY IN THE TOWNSHIP OF FREDERICKSBURG IN THE COUNTY OF LENNOX AND ADDINGTON.

PETERBOROUGH, ONT., July 8th, 1912. .

SIR,—I have the honor to report that, agreeable with your letter of May 20th last, I spent the 22nd and 23rd at your Department in getting all the information and data I possibly could which I thought might be of use to me in connection with my proposed survey and investigation as to the ownership of some large marshes in Hay Bay, in the Township of Fredericksburg, in the County of Lennox and Addington.

Having received tracings and instructions from your Department, dated May 29th, I proceeded to Napanee on June the 7th, where I met and consulted with Mr. Carscallen. I was, however, unable to see Mr. U. M. Wilson until the following day.

On June 17th I left Peterborough—taking my assistant with me. I also took a chainman along, as I learned that the farmers were very busy and that it was doubtful if I could employ a suitable man on or near the work. On the evening of the same day we reached the home of John Sherman, on Lot 6, Concession III., Township of Fredericksburg.

Having procured a satisfactory observation for azimuth on the morning of June 18th, I immediately proceeded to carry out your instructions by measuring up several of the lines between the respective lots, in order to ascertain if these lots contained two hundred acres, or thereabouts, as intended by the original survey and specified in the original Patents from the Crown.

I am pleased to report that all the lots measured by me show that the original patentees received approximately two hundred acres exclusive of the area of any marsh lying in front of said lots. With regard to locating the exact position of the rear line of these lots as intended in the original survey, I found some difficulty—this being a very old settled township I found that lots and parts of lots of various areas, shapes, and descriptions, have changed hands many times, so that—generally speaking—the lay-out of the township as now held by the various owners bears very little resemblance to that intended by the original survey. Between the rear end of the concession fronting on Hay Bay and the rear end of the concession fronting on the Napanee River there are several gores or irregular shaped blocks of land. There is, however, as far as I could ascertain, no dispute whatever with regard to the location of the side lines, rear lines, or property lines between any of the various lots or parcels of land in this section of the township. All the property lines in this locality are well defined by old rail fences (in some places replaced in recent years by wire). These fences are well banked on both sides by stones which have been picked from the adjoining fields by successive generations.

From the best evidence I could get the shore line of Hay Bay has changed position very little during the past 128 years or since the original survey of the township was made: as evidence of this fact, I may say that a stone monument planted early in the last century to mark the intersection of the shore line of Hay Bay with the line between Lots 14 and C.C. now stands exactly, at what I would consider, the shore line of the present day. I might say, however, that I found the

water in Hay Bay exceptionally high this season, many of the older residents in this locality stating that it was as high as they had ever remembered seeing it during the past fifty years.

Generally speaking the line of demarkation between the marsh and the land is well defined. The area of the marsh in front of these lots is, however, governed to a large extent by the rise and fall of the waters of Hay Bay, there being a considerable larger area of marsh in sight on my leaving there June 29th than there was to be seen on my arrival there June 17th.

The parties who claim they own the marsh adjoining their respective parcels of land are—

(1.A) John J. Clark, owner of the west half Lot 9, Concession III.

(2.A) Cornell's Island.

(2) James Cuthill, owner of Lot D.D. Concession III.

(3.A) Samuel Asseltine, owner of the rear or northerly half of Lot C.C. between the 2nd and 3rd concessions.

(3.B) Samuel Asseltine owner of the front or south-easterly half of Lot C.C. between the 2nd and 3rd concessions.

Acting on the advice of the parties I was instructed to consult in connection with this matter—my survey and investigations were confined chiefly to the above five parcels of which I made a careful survey and also of the marshes adjoining them—the respective areas will be found on the accompanying plan—the area of the marsh being variable, the figures I give would, of course, only hold good when computed at the same height of water as when my measurements were made.

(1.A) West half of Lot 9, Concession III., patented to Alex. Hanna, now owned by John J. Clark, and described as follows:—"Commencing at the centre of the said lot on the north side of Hay Bay, then north 31 degrees west 105 chains 27 links, then south 59 degrees west 9 chains 50 links, then south 31 degrees east 105 chains 27 links more or less to Hay Bay, then north-easterly along the water's edge to the place of beginning, containing 100 acres."

As will be seen by the accompanying plan the above description encloses a small area of marsh 3.13 acres of which, in my opinion, the owner John J. Clark is entitled to. I do not think, however, that he has any claim or title to the marsh 4.46 ac. lying in front of said lot.

(2.A) Cornell's Island. Sold by the Indian Department May 30th, 1877, to Martin Shewman—now owned by John J. Clark and described as follows:—"All that parcel or tract of land situate, lying, and being in the County of Lennox in the Province of Ontario, in our Dominion of Canada, containing by admeasurement thirty-eight acres be the same more or less, composed of the Island in the Bay of Quinte, known as Dockstatter's or Cornell's Island, situate, lying and being in Hay Bay, opposite lots numbers ten and eleven in the township of Fredericksburg." I find this island contains 42.87 acres, the line between the land and marsh all round the island is fairly well defined. In my opinion John J. Clark has no title whatever to the marsh adjoining or surrounding this island.

(2) Lot D.D., Concession III., patented to James McNabb, now owned by James Cuthill, and described as follows:—"Commencing in front on the north side of Big Creek in the limit between Lots Nos. 13' and D.D. at the south-

east angle of the said lot tract, then north 31 degrees 30 minutes west 50 chains more or less to Little Creek, then southerly along the water's edge with the stream to Big Creek, then north-easterly up Big Creek to the place of beginning, containing 60 acres more or less." I find this Lot D.D. to contain 78.09 acre of land and 99 acres of marsh adjoining.

As will be seen by the accompanying plan both Big Creek and Little Creek—whose shore lines or "waters edge" are fairly well defined, are out in the marsh a considerable distance from the land, and I am of the opinion—from the wording of the above description—that James Cuthill is entitled to all the land and marsh enclosed by said description.

(3.A) The rear or northerly half of Lot C.C., Concession III. Patented to David Bowen, now owned by Samuel Asseltine and described as follows:—"Commencing in the centre of the said concession in the limit between the said Lot C.C. and Lot No. 14, then north 31 degrees 30 minutes west 52 chains 63½ links more or less to the allowance for road in rear of the said concession, then south 50 degrees west to Hay Bay, then southerly along the edge of the said bay following its several turnings and windings in the said Lot C.C. to the centre of the said concession, then north 59 degrees east to the place of beginning, containing 150 acres more or less." I find this part of Lot C.C. to contain 91.50 acres of land with approximately 663 acres of marsh adjoining. I do not consider that Mr. Asseltine has any title to this marsh area.

(3.B) The front or south-easterly half of Lot C.C., Concession III. Patented to Philip Smith, now owned by Samuel Asseltine and described as follows:—"Commencing in front of the said concession in the limit between the said Lot C.C. and Lot No. 14, then north 31 degrees 30 minutes west 52 chains, 63½ links more or less to the centre of the said concession, then south 59 degrees west to Hay Bay, then southerly along the edge of said bay, following it several turnings and windings in the said Lot C.C. to the allowance for road in front of the said concession, then north 59 degrees east to the place of beginning, containing 150 acres, more or less." I find this part of Lot C. C. to contain 76.27 acres of land, with approximately 129 acres of marsh adjoining. I do not consider that Mr. Asseltine has any title to the marsh area.

With regard to that part of your instructions to me in which you say: "You might call upon any of the people who claim to own the marsh lands under the grants from the Crown and explain matters to them, because they may not clearly understand that if they claim from the edge of the marsh instead of from the edge of Hay Bay they can only go back 105 chains 27 links according to their patents, and in the event of their owning marsh the probability is there will be a large amount of good land in the rear of their lots not belonging to them."

I was not long on the ground before I fully realized that it would be utterly useless on my part to offer this explanation—all the land owners interested in this matter are acting under legal advice—this marsh area yields a revenue of about \$2,000 a year in rat pelts, and all the parties I interviewed seem prepared to fight the matter to a court of last resort.

In conclusion, I beg to state that it seems very clear to my mind that according to the original surveys, plans and patents, the lots fronting on Hay Bay were intended to commence at the inner edge of the marsh—if the original surveyor intended that any of these Lots should include the marsh area in front, the lines between the respective lots as shown on the original plans would have been shown projected out to the outer edge of the marsh where deep water begins.



I will, perhaps, be pardoned for giving my opinion on what might be called the legal aspect of the question of title involved. I did not, however, consider that my report or plan would be complete and of use to your Department, without doing so.

All of which is respectfully submitted.

I have the honor to be, Sir,

Your obedient servant,

(Signed) J. W. FITZGERALD,

*Ontario Land Surveyor.*

The Honourable the Minister of Lands, Forests and Mines,  
Toronto, Ont.

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*Appendix 33.*

RE-SURVEY OF CACHE LAKE, TOWNSHIP OF CANISBAY, ALGONQUIN NATIONAL PARK.

TORONTO, 29th May, 1913.

SIR,—We have the honour to submit the following report on the re-survey of Cache Lake, in the township of Canisbay, Algonquin National Park, under instructions from your Department bearing date 22nd January, 1913.

Immediately upon receipt of the instructions, arrangements were begun by correspondence with the parties referred to therein, and our party left here in charge of Mr. Ralph Mackenzie Anderson, O.L.S., a member of our firm, on 8th February. The work, involving a traverse of the whole shore of the lake and of the islands therein, was begun at once and prosecuted steadily, in accordance with instructions, until completed on 26th February.

In nearly all cases the lot angles sought were found to be defined by original posts or bearing trees. Wherever necessary, new posts were planted at the lot corners and shown as renewed in the accompanying field notes, but where the original cedar posts remained in good condition, they were left undisturbed. The intersections of all lot lines with the road allowance around the shore of the lake were marked with iron posts, and bearing trees were blazed and noted. All lines surveyed were well opened out and blazed.

The limits of lands already leased, wherever they intersected the shore line, were defined by posts and the lines opened out. The descriptions in some of these leases are somewhat at variance with the facts, owing chiefly to the insufficiency of data on record in the Department.

The part of Crown lease Number 1,816 lying south of the Grand Trunk Railway right of way is not shown on the blueprint furnished us with sufficient data to admit of its boundaries being actually defined on the ground, and in the absence of a written description from the lease, we were unable to define its limits.



In the case of Crown lease Number 1,841, the actual courses of the boundaries and tie lines differ from those set forth in the lease.

The actual area of the lands covered by the description in Crown lease Number 1,842 differs from that stated in the lease.

Crown lease Number 1,843, covering Treasure Island, does not appear to include more than the main island. There is, however, a smaller island to the north-east of the main island, hitherto not shown on recorded plans, and which, while too small for a separate holding, might prove a detriment to the lessee of the larger island, in the event of temporary occupation by undesirable persons.

In the case of Crown lease Number 1,856, the lands actually occupied and improved and intended to be covered by the lease lie considerably to the west of the land covered by the description in the lease.

Already in a number of cases houses have been erected on the shore and islands at points not covered by the leases included by the instructions furnished us. The location of these improvements has been carefully set down in the field notes and shown upon the plan.

Iron posts were planted at selected points throughout the traverse survey and their positions referenced by bearing trees duly blazed, marked, and entered in the field notes. Owing to the supply of iron posts being insufficient for the number of points to be perpetuated, trees were blazed on four sides and marked with the proper numbers, care being taken that the blazing did not unnecessarily injure the trees. The posts and trees referred to were numbered consecutively, C1, C2, C3, etc., around the shore were located, the consecutive numbering being then carried to the islands.

As directed by the instructions the part of the lake shore lying north of the railroad was examined as to its suitability for summer resorts and it was decided to be unnecessary to run lines or plant any posts for that purpose, as owing to its isolated position it is not probable that leases will be applied for in this part of the lake.

With regard to the physical features of the shore and islands in this lake, the land may be generally described as rising to an elevation of ten to fifteen feet above the present level of the water.

The following exceptions were noted: A ridge running from reference post C32 to C33 rises to about forty feet above the water. East of reference post C4 and extending for about five chains on either side of the east limit of Lot Number 8, Concession 5, a bluff rises to the height of one hundred feet. On the south shore of the Madawaska River where it enters the lake, a ridge rising to a height of about fifty feet leaves the shore at the mouth of the river and runs south-westerly inland. At the ends of the bays the shores are low-lying and somewhat swampy.

Particulars in detail of the various parts of the shore are given in the field notes. The country at a short distance back from the shores of the lake rises in some cases to a height of from one hundred and fifty to two hundred and fifty feet, affording good views of the surrounding scenery.

As nearly as we could ascertain, the present surface of the water is somewhat higher than would be the case in a state of nature, owing to the fact that the dam at the outlet, constructed during timber operations, has not been entirely removed, and if free vent were given it is to be expected that the lake level would be lowered. The level, therefore, depends upon whether the remainder of the dam is to be maintained or allowed to disappear in the course of time.

The shore line is in general rocky and somewhat similar in appearance to the Muskoka region.

The shores and territory inland are well timbered with hemlock, birch, cedar and spruce, with scattered red pine and occasional ridges of hard maple. This region having been within the area of lumber operations, all the more marketable pine and hemlock timbers have been taken off. Up to the present, fire has apparently done no damage in the immediate vicinity of Cache Lake. The timber on the larger islands is similar to that on the main land.

Accompanying this report are (a) a plan on scale 10 chains to one inch, (b) a plan on scale 4 chains to one inch, showing all traverse lines with courses and distances and other details, (c) field notes of entire survey.

We have the honour to be, Sir.

Your obedient servants,

(Sgd.) SPEIGHT AND VAN NOSTRAND,

*Ontario Land Surveyors.*

The Honourable the Minister of Lands, Forests and Mines,  
Toronto, Ont.

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*Appendix No. 34.*

SURVEY OF THE DAWSON ROAD LOTS DISTRICT OF THUNDER BAY.

LISTOWEL, December 2nd, 1912.

Sir,—In pursuance with your instructions, dated June 17th, 1912, I beg leave to report the following: On July 8th I left Listowel and proceeded to Port Arthur by steamer and rail via Port McNicoll, and arrived there on July 11th. I procured my outfit and most of my party at Port Arthur and started the work on July 13th. I had some difficulty in getting a cook to start the job; when you try to hire a cook and he finds he has to cook with an open fire, he generally gets drunk, and when the time comes and the train pulls out he is missing. I started the work by taking an observation on the bank of the Kaministiquia River and from this point I traversed the Dawson Road east and west. From Kaministiquia west I traversed the location according to the field notes, and when I got to the side road between Lots 30 and 31 I found that I was four chains and forty-four links north of the road. From this point west I traversed the road as it was built. A good many buildings were going up along the road and settlers were all using the old road as the boundary between concessions A and B. The old Dawson Road is in good condition from Lot 1 to Lot 80 at the Ascondage River, and if the underbrush and small trees were removed and the bridges and culverts rebuilt this road could be used for all kinds of traffic, pack trains, waggons or autos; one day last July an auto went from Port Arthur to Kaministiquia on the Dawson Road, a distance of 20 miles. Finlanders are the principal settlers in this section and they seem to be hard-working and industrious, most of their log buildings are very neat-

ly built and when finished and properly calked will make warm houses. Most of these settlers have cows and chickens and they have most of them put up stacks of hay for the winter; quite an amount of grass grows along the rivers and creeks and in open places along the railway tracks.

I beg leave to report also that many of these settlers have gardens growing almost any of the more common kind of vegetables, such as potatoes, cabbage, turnips, lettuce, onions, radishes, but on account of the last season being very wet, some of the vegetables were beginning to rot, and did not do as well as if it had been a dry season. The land in this section is nearly all red clay, and clay loam. The country is hilly and there are no large muskegs or marshy land. In places the country is somewhat rocky, the most being west of Lot 55 and south of the Dawson Road. There are also a number of small gravel beds extending through the whole section. It is of good quality as can be seen along the Dawson Road.

I took considerable notice of the rocky country and found indications of iron in many places but found no indications of other more valuable minerals.

The timber throughout this area is nearly all second growth, especially the portions west of the Kaministiquia River where the C.P.R. crosses. Most of the timber is small and very little of it will be suitable for lumber. The different kinds found in order of their abundance, are jack pine to 12 inches, spruce to 12 inches, poplar, balsam, tamarac, white birch, a few white ash. Fire has destroyed a great portion of the timber. Large quantities of jack pine is still standing along the Dawson Road west of Lot 50 and could easily be made into cordwood and shipped out from Finmark on the C.P.R., or from the C.N.R. The country is well watered with small streams but the water is not as good as that found east of Port Arthur.

While engaged in the work I took five astronomical observations and checked the bearings of my lines with the C.P.R., C.N.R. and G.T.P. locations. On account of the season being wet the work was somewhat retarded. We worked nearly every day in the rain, and had the country been wet with swamps and muskegs, we could not have done the work in the same time. The eight iron posts provided by your Department were planted and marked according to your instructions at the following places: S.E. corner, Lot 1, Con. 3. N.E. corner, Lot 11, Con. B. N.E. corner, Lot 8, Con. 2. S.E. corner, Lot 31, Con. A. N.W. corner, Lot 22, Con. 2. S.W. corner, Lot 22, Con. 2. S.W. corner, Lot 60, Con. A., and at S.W. corner, Lot 70, Con. B.

Regarding the old posts and lines of the former survey, I beg leave to say that the only evidence of a former survey I found was a post at the south-east corner of Lot 1, Concession B, and the side line between Lots 45 and 46, Concession A. This line and the line of my survey ran almost parallel for about 20 chains and only a few links apart, but before the end of the concession was reached the two lines crossed.

Many of the settlers along the Dawson Road were working on the railways as section men, and all those whom I had conversation with were quite satisfied to stay with their homesteads. All the buildings erected by the settlers are shown on the plan and field notes.

Whalen & Co., of Port Arthur, had a tie camp on the Matawin River bank on Lot 38, Concession A, where about one million railroad ties were taken out of the river and shipped to different points east and west. During the progress of the work the company employed about 75 men.



With regard to fish and game beg leave to say that this section is well supplied with rabbits and partridge, and a few wolves and porcupine. We tried the Matawin River and also the smaller streams but were not successful in getting any fish. The section is also well supplied with wild fruit, such as raspberries, strawberries, cranberries, and in one place we found quite a number of wild plums.

I have the honour to be,

Sir,

Your obedient servant,

(Signed) E. D. BOLTON,

Ontario Land Surveyor.

The Honourable the Minister of Lands, Forests and Mines,  
Toronto, Ont.

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*Appendix No. 35.*

RE-SURVEY OF PARTS OF THE TOWNSHIPS OF BLAKE AND CROOKS DISTRICT OF  
THUNDER BAY.

FORT WILLIAM, ONT., 7th April, 1913.

Sir,—In accordance with your instructions of the 7th November last, I have made a re-survey of certain parts of the Townships of Blake and Crooks.

As there was urgent need of certain lines in Crooks, I made a flying trip there, afterwards returning to the city for more men and outfit. Then, starting in Blake, I worked south, cleaning up the work as I went.

I commenced by re-opening two miles of the resurvey lines of O.L.S. Macdougall, and then ran south between sections 9 and 10, using this as a base line. Evidences of the old lines were very hard to find, and on this line between sections 9 and 10, I ran almost to the south limit of the township before finding any satisfactory evidences of the old lines to check by. The same is true to a great extent of the east and west lines, though once or twice in spruce swamps we found good evidences of the line.

A great number of comparatively recent compass lines have been run in Blake township, oftentimes blazed, and tending to confusion. At one point, too, I found a line with very old blazes, which, while not agreeing closely with our north and south chainage on our base line, I was inclined to accept it, until after opening it up for over a mile. I found it swung gradually to the south. In Crooks, too, I found lines well marked with old blazes, which were apparently run to mark mining claims which were never taken up. These lines, when first starting in, tended to create confusion and mislead.

A great number of lines had to be first run as trial lines and then rerun and opened up on the true line, after checking up on blazes two miles and more from the starting point.



Bearing trees or posts we very rarely found, except where we ran to mining locations, where they could usually be found. In this country the greater part of which has been lumbered over, and frequently burnt over, there were sometimes stumps standing which would seem to indicate the position of the bearing trees, but there was no means of identifying them, the tops being gone and the blaze. It seems that if in addition to marking "B.T." on a tree in the usual way, some means of marking the tree lower down could be adopted, such as cutting three "V" marks on the upper part of the root beneath it, it would be very useful evidence when the "B.T." was gone, even if it were not given the same standing.

There is much good land in the two townships, particularly in Crooks. The country covered in Blake is very broken, and in many places it will be impossible to lay out roads along lot lines. The land will oftentimes rise steadily for possibly a mile and then drop almost sheer for from one to two hundred feet, but the land at top and bottom may be equally good.

There is not much large standing timber, but a great deal of old burnt pine stumps standing, making cutting very heavy in parts. In Blake there is some very fair pine scattered through, while in Crooks in addition to a little pine, there is, south of the Cloud River, quite a little pulpwood.

Every effort was made to plant the posts firmly in the ground, an old axe being carried for the purpose of cutting into the frost, but where the ground was stony, this was not very satisfactory, and I would suggest that you allow me to send two men over the lines as soon as the frost is out, to reset them. I would furthermore suggest the desirability of planting iron posts alongside the wooden ones on at least one line through these townships.

As all available teams had been hired at a premium by the Superior Brick Co., whose plant is now under construction at Rosslyn, it was costly to hire teams, and oftentimes almost impossible to get them at all. This caused me to move camp as little as possible, involving very long walks in difficult country, so that in the middle of winter it was necessary to leave camp before daylight, and often return after dark in order to accomplish anything. This was hard on the party, and with the comparative closeness of the railway, and the high wages being paid by the pulpwood camps in the vicinity, made it very difficult to hold the party together. Only the hiring of the best cook obtainable and putting on the best possible board held some of the men. My instructions were to hire the settlers as far as possible, but apart from my first trip into Crooks, all settlers willing to work were already engaged.

As instructed, I have not prepared any regular field notes or plans of the townships, but send herewith an outline plan showing the lines run.

I also beg to enclose accounts and vouchers in triplicate, and pay-list, in all amounting to \$2,630.80, of which I have already received \$2,000.00 on account.

I would also request that some allowance be made for camp equipment. I spent \$175 in this way, and when the work was done it was of comparatively little value. For instance, I spent \$57.80 on tents but allowing for the cost of necessary repairs, they are probably not worth more than \$20. I spent \$75 on hardware, stoves and snow shoes, the latter are good for a lot of wear yet, but the heating stoves had to be renewed in the middle of the season, and the new ones were hardly worth bringing in on the completion of the work, and the other hardware was of little value. I bought \$42 worth of blankets to supplement the supply of the men.

Allowing for the cost of the necessary cleaning, they are not worth more than half of this now. Under these circumstances, I would request that some allowance be made on this account.

I have the honour to be,

Sir,

Your obedient servant,

(Signed) E. R. BINGHAM,

Ontario Land Surveyor.

The Honourable the Minister of Lands, Forests and Mines,  
Toronto, Ont.

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*Appendix No. 36.*

SURVEY OF THE TOWNSHIP OF MATHIEU, DISTRICT OF RAINY RIVER.

FORT FRANCES, Ont., Dec. 27th, 1912.

SIR,—I have the honor to submit the following report on the survey of the Township of Mathieu, in the District of Rainy River, performed under instructions from your Department, dated the twenty-ninth day of May, A.D. nineteen hundred and twelve.

This township is bounded on the south by the Township of Dewart, on the west by the township of Morson, on the north by Sabaskong Bay of the Lake of the Woods, and on the east by unsurveyed lands.

I commenced work on the twenty-seventh day of July, having moved in by boat from the Town of Rainy River to the head of navigation on Big Grassy River; thence packing in to the west boundary of the township.

The east boundary of Morson and the north boundary of Dewart were cleaned out and the survey of the township of Mathieu commenced at its south-west angle. I did not find this point to agree with the field notes of the Township of Morson. I found four posts, a wooden and an iron post marked "Dewart" and "Tovell" and a wooden and an iron post marked "Morson." These posts stand all together at a distance of sixty-three links east from a two-inch-square iron post marked R. XXIV. XXV. E., so that there is no jog between Morson and Dewart as shown in field notes. I commenced at these four posts marking the iron post marked Morson with the name "Mathieu" on the east and I then laid out the second and other concessions and the side lines, west and north, astronomically, as directed in the instructions as nearly as possible.

The iron posts already planted at the south-east and the north-east angles of the Township of Morson were marked on their correct sides "Mathieu." The iron post at the north-east angle of the Township of Dewart was also marked on its correct side. Other iron posts, supplied by your Department, were planted, properly marked, as directed, alongside wooden posts, one at the intersection of the south boundary with the line between lots six and seven, one at the intersection of the

line in front of the fourth concession with this line of lots, and one at the lake shore on this same line: also one at the intersection of the west boundary with the line between concessions three and four, one at the intersection of the line between these concessions with the east boundary and one on the east boundary at the shore of the Lake of the Woods. These were planted with the view of insuring permanency for the survey in case of fire.

All lines run were well opened and blazed, substantial wooden posts were planted, as directed, every possible care being taken in the planting and marking of the posts, while frequent observations of Polaris, at eastern elongation, were taken to insure the correctness of the directions of the lines. The shore line of Sabaskong Bay of the Lake of the Woods was carefully traversed, courses being tied in to each post on the lake shore in passing.

The work itself was proceeded with in the ordinary manner, the excessive length of time taken in making the survey was entirely due to wet weather.

The township as a whole is rough, rocky and broken. The portion of it fit for agricultural purposes being very small, twenty-five per cent. at the most, consisting principally of a narrow belt along the valley of the Big Grassy River, and one lot in the valley of the Split-Rock River. A few good pieces could also be picked out along the shore of Sabaskong Bay. The south-west quarter of the township is composed of jack pine sandhills and muskeg, the south-east quarter is rock and muskeg, the north half is extremely rough and rocky.

For timber the township is of little value, there being nothing on it except small second growth jack pine growing on old brulé, with the exception of lots ten, eleven and twelve in concessions four, five, six and seven, which lots partially escaped the fire and have some good timber on them, chiefly jack pine with poplar and spruce and a few scattering red and white pines.

No indications of valuable minerals were observed; the magnetic needle holding a steady variation of eight degrees and thirty minutes east throughout the township. Samples of the country rock have been sent to your Department.

Accompanying this report are plan, field notes, timber plan and list of squatters.

I have the honour to be,

Sir,

Your obedient servant,

(Signed) D. J. GILLON,

Ontario Land Surveyor.

The Honourable the Minister of Lands, Forests and Mines,  
Toronto, Ont.



*Appendix No. 37.*

## ALGONQUIN PROVINCIAL PARK.

ALGONQUIN PARK, 31st October, 1913.

HONOURABLE SIR,—I beg to hand you my annual report of the Algonquin Provincial Park for the fiscal year ending the 31st day of October, 1913.

This was one of the finest years from a tourist's standpoint in my recollection, and hundreds of visitors from Canada, the United States, Great Britain, and other countries, took advantage of it to spend their holidays on our splendid lakes.

The Park has also become popular as a winter resort, and the Highland Inn was patronized to its full capacity; in fact the management at times were not able to take all who wished to come. This is gratifying for several reasons. It proves that real benefit is being derived from the Park as a health and pleasure resort, and that one of the ends for which the Park was set aside has been accomplished; also, that the people of the Province are taking a deep interest in the Provincial Park and are in sympathy with the work being done in it.

A considerable revenue is now derived from fishing licenses and rents, as well as furs taken and live animals sold, amounting for the past year to: fishing licenses, \$1,782; rents, \$787.50; furs, \$5,424.10; live animals, \$605.25; fines, \$50; sale of logs, \$405.60; sundries, \$3.50; total, \$9,057.95.

The fishing during the past season has been good and some fine specimens were taken, the largest coming under my notice being a salmon trout seventeen pounds in weight. Some interesting specimens were taken in Delano lake that had the appearance of a hybrid, between the salmon and speckled trout. They have the form of the speckled trout with its markings, but have a very decidedly forked tail. One of these is described by Prof. Prince, of the Department of Marine and fisheries, Ottawa, in the following letter:—

OTTAWA, JANUARY 19TH, 1914.

DEAR MR. BABLETT:

The specimen of peculiar trout which you sent some time ago has been carefully examined, and as I already gave you a hint, it really appears to be a hybrid, namely, the brook-trout and the grey trout (or lake trout).

The dental features and the nature of the vomer, as well as the peculiar external color and the shape of the tail, all indicate a combination of two species, which as you know, are now separated further than they used to be.

The brook-trout and the lake-trout were at one time included under the same Genus, *Salvelinus*, but they have appeared to be so distinct as to now be separated into two Genera; the grey-trout being put in the Genus *Cristatomer*, a hybrid specially connected with two separate Genera is a remarkable occurrence, and some mention of it should be made in the sporting journals, as it is an exceedingly interesting occurrence.

You will remember that more than a year ago, in June, 1912, Mr. Gall sent a specimen of a fish which was regarded as a hybrid, and when I come to see you again, I should like to talk with you about the occurrence of the hybrid specimens, as the nature of the egg and the feature of hybridisation are so remarkable scientifically that it is worth while trying some experimental work to see if the hybrids can be produced artificially.

With all good wishes for the season, and thanking you for sending the specimens, I am,

Yours faithfully,

EDWARD E. PRINCE.

*Dominion Commissioner of Fisheries.*



A number of salmon trout fry and fingerling black bass were put into the lakes near headquarters.

We have a fine site for a fish hatchery, and I hope you will some day in the near future establish one here. We could then keep our lakes stocked and also supply outside sections.

Game of all kinds has very much increased. A number of beaver, otter, mink, marten, fisher, musk-rat, raccoon and ermine were taken and the skins disposed of, realizing \$5,424.10.

Live beaver and some live mink were also sold to the value of \$605.25. The former went to points in Prince Edward Island, Ontario, and the United States. There now being a great demand for live animals of all kinds for fur-farming purposes, we are in compliance with your instructions, preparing to supply the same from the Park. The prices for live animals are much greater than for pelts, and the departure is strictly in keeping with one of the objects in view when establishing the park, viz.: the multiplication and spread of our fur-bearing animals. The annual increase of these in the Park is so great that the number taken in the past three years has caused no perceptible diminution.

The capercallie introduced some years ago are not making the showing I would wish, although several were reported by reliable parties, as having been seen last year. They seem, however, to be working to the north and prefer the pine woods.

Wolves are still numerous and do a great deal of damage among the deer. We have secured sixty of the pests, and know that many were poisoned that our men did not get, owing to the snow covering up the tracks before they were found.

This has been an unusually good year for the deer, and fewer were killed by the wolves during the past winter than for any one of the past ten years. Deer are very abundant and moose are becoming more so; there is a yard of the latter within a few miles of headquarters.

Fires have been bad, a great many having been started by the locomotives on the Grand Trunk railway. I am glad, however, to be able to report no damage done in the Government limits, and elsewhere in the Park—most of them were over old burns. The Gillies Bros. had some pine burnt which is now being taken out. I should like to mention here that Mr. Colman, Superintendent of the Ottawa Division of the Grand Trunk railway, gave every assistance in his power and rushed men to the scene of the fires at once, also, gave strict orders to his men that they must give immediate assistance in case of fire.

The Grand Trunk railway have built a hotel and six cottages at Smoke Lake for the accommodation of visitors. These are of cedar logs, and fitted with all modern conveniences, such as fire-places, baths, etc. Each cottage will accommodate six to ten people, and there are several rooms in the main building. They have also guides' house, stables, etc. A like plant on a larger scale is now under construction at Big Island Lake. They have built a road from the Highland Inn at headquarters to each of these points, and run a stage on both of them.

The Canadian Northern Railway are pushing their branch through the north end of the Park, the steel being laid as far as Cedar Lake from the intersection with the Grand Trunk Railway to the west. This line follows some of our finest lakes, Kioshkoqui, Mink, Couchon, Aura Lee and Cedar, thence down the Petewawa to Pembroke. It will be a very popular route with the angler and canoeist, as these

lakes and rivers abound with the finest speckled trout and salmon trout. A great number of men are still employed on this line in the Park from Cedar Lake east.

Our staff has been composed of twenty-six men and superintendent. During the trapping season their time has been taken up in patrolling the sections allotted them, two men travelling together. Owing to the constant demand for the men at fires, I have not been able to get all the shelter houses built I had hoped. We have built a very fine one at White Trout Lake, repaired several others, and cut out a lot of portages. The superintendent's house at headquarters has been re-shingled and fresh drains laid down from both houses. Joe Lake dam has also been substantially repaired, so that a regular head of water can be held at this point, which is very necessary.

I have the honour to be, Honourable Sir,

Yours very sincerely,

The Honourable W. H. Hearst,

G. W. BARTLETT.

Minister of Lands, Forests and Mines,  
Toronto.

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*Appendix No. 38.*

## REPORT OF THE FORESTRY BRANCH.

SIR,—I have the honor to present herewith the First Annual Report of the Forestry Branch for the year 1913.

During the autumn of 1912, I was transferred from the Department of Agriculture to the Department of Lands, Forests and Mines. Since my transfer, the work in this Branch, has been largely concerned with general questions of reforestation and particularly the administration of the Norfolk Forest Station. This Branch has also had charge of the fire protection, along the railways in Ontario which are under the jurisdiction of the Board of Railway Commissioners for Canada. In addition to the above duties, various forest investigations and minor reports have been made and a course of lectures in forestry has been delivered to the students at the Ontario Agricultural College.

## NORFOLK FOREST STATION.

The Norfolk Forest Station was started in 1909 and to-day contains 1,500 acres of land. This land is composed of sandy ridges and is made up of second-growth pine and oak; abandoned fields and blow sand ridges. The chief work being carried on at this station is the production of nursery stock for local planting and for distribution to prospective planters, throughout the Province.

## FOREST NURSERIES.

The Forest Nurseries have produced during this last season a very good lot of planting material. There is at present in the nurseries 846,000 plants in nursery lines and 400,000 seedlings in seed beds.

The following is an approximate estimate of the nursery stock:—

*In Nursery Lines.*

White Pine . . . . .	227,000
Scotch Pine . . . . .	266,000
Red or Norway Pine . . . . .	92,500
White Cedar . . . . .	40,000
Bull Pine . . . . .	7,000
Black Locust . . . . .	80,000
White Ash . . . . .	20,000
Sugar Maple . . . . .	60,000
Soft Maple . . . . .	20,000
Black Walnut . . . . .	10,000
Butternut . . . . .	4,000
Miscellaneous . . . . .	20,000

*In Seed Beds.*

White Pine . . . . .	300,000
Red or Norway Pine . . . . .	100,000
Jack Pine . . . . .	50,000
Miscellaneous . . . . .	50,000

## DEMONSTRATION PLANTATIONS.

At this station, about 300,000 young forest trees have been planted composed chiefly of:—white pine, red pine, Scotch pine, jack pine, black locust, red oak, chestnut and white ash.

The earliest plantings of 1909, in which white pine, Scotch pine and jack pine were planted upon pure sand formations, where the sand was blowing considerably, indicate that the best results will be obtained by the use of jack pine and Scotch pine. Many of the Scotch pine and jack pine, which were about twelve to fifteen inches in height at time of planting (1909) are now (1913) from four to six feet in height. Upon the better classes of soil white pine is proving more satisfactory and will be used wherever possible, as its ultimate value makes it more desirable than the other pines.

A plantation made with black locust in (1909) has not proven altogether satisfactory, although the growth during the first two years was quite remarkable, many trees having reached a height of eight to ten feet. During the last winter these trees were badly killed with the frost and the value of this tree, from the standpoint of hardiness, is as yet uncertain.

Various experiments are being conducted at this station along the lines of forest planting, which should give valuable data as to cost of planting; desirability of the various species and general results, which should prove of value in years to come. It is somewhat early to report upon the comparative values of planting in connection with this work.

## FOREST TREE DISTRIBUTION.

In addition to an Experimental Station in Norfolk, it is desirable to demonstrate forest planting throughout the older parts of Ontario.

The percentage of well-stocked woodlands in Older Ontario is becoming very low. Many counties of Southern Ontario, possess less woodland than is to be found in the older countries of Europe. While the southern part of Ontario is largely made up of valuable agricultural land, there is still a large percentage of untitled soil that should have never been denuded. These waste areas are composed of steep hillsides: sandy or gravelly ridges and rocky outcroppings. It is highly desirable that the possibility of reforesting these areas, at a reasonable cost, should be demonstrated throughout Ontario.

As the necessity and practicability of reforesting is little appreciated in this new country, the Government has been carrying on, since 1905, a system of distributing forest trees to those desiring to plant as outlined in the following circular:—

## CIRCULAR No. 8.

1. The Department of Lands, Forests and Mines of the Province of Ontario desires to assist farmers to improve their woodlots, and reforest waste portions of the farm. To accomplish this a system of co-operation is to be carried out as follows:

2. The Department, as far as the means at its disposal will permit, will assist in the growing of a forest plantation or woodlot, by directing through one of its officers as to the preparation of soil, varieties to plant and manner of planting, and as to care after planting.

3. The Department will also endeavor to furnish seedling trees or cuttings as planting material free of charge, but the person receiving such material shall pay the cost of transportation by express to nearest express office. 1,000 to 2,000 plants will range from 100 to 200 lbs. in weight. This season (1914) the trees will be shipped by



Canadian Express from St. Williams, Norfolk County. If the applicant desires to know about what the express charges will be he should find out from his local express agent the rate per 100 lbs. from the above shipping point. It is not considered safe to ship these plants by freight, and this Department cannot receive money to prepay transportation charges. Care should be exercised to fill in properly Post Office and Express Office in Application Blank.

4. The Department advises that those undertaking waste land planting make a start of one acre the first season. Two acres will be the largest area for which the Department will undertake to furnish planting material in any one year. Larger areas may be planted by arranging to continue the work throughout successive seasons. Prospective planters should read pages 15 to 30 of Farm Forestry Bulletin 209, Ontario Department of Agriculture, which will give a more detailed idea of what waste land planting means. Plants should be placed from 4 to 5 feet apart each way.

At 4 feet spacing an acre will require 2,722 trees.

At 5 feet spacing an acre will require 1,742 trees.

Make an estimate of your acreage and fill in the blank in application form accordingly.

5. It shall be understood that the owner, on his part, must prepare the soil, plant and care for the trees, and do all the actual work in connection with the plantations, in accordance with the directions of the officers of the Department. The owner shall also agree to provide protection for the planted trees against animals by fencing or otherwise, and where necessary, against fire by some effective means.

6. The Department prefers that plantations be made on such waste portions of the farm, as steep hillsides, light sandy, rocky or gravelly spots, swamp land, portions of farm cut off by streams or otherwise. Such land can usually be profitably devoted to wood production if proper species are planted. However, in certain localities without woodlands it may be found advisable to plant on good agricultural soil, if the owner so desires. In cases where tillable land is to be planted it will be advisable to summer fallow. Cultivation for one or two seasons after planting on good soils, where rank weed growth might follow, will be of great benefit to plantation.

7. The Department emphasizes the value of planting evergreen belts about open borders of woodlots. Planting in the woodlot is discussed on pages 11 and 12 of Bulletin 209.

8. It will be noticed that this system is co-operative in character. The Department furnishes planting material and expert advice, but does not guarantee to furnish any specific quantity of planting material. The Department reserves the right to accept or refuse applications if, in the opinion of the officers in charge, the location offered does not afford satisfactory facilities for the experimental and educational features of the work.

9. It is desired to make this work of educational value, and the owner will be required to allow public inspection of the planted areas, whenever this can be done without injury to the other crops.

10. Attention is called to the fact that the Forestry Department furnish trees only for forest plantation work on waste land, or land which is undesirable to till for annual crops. No fruit trees, ornamental trees or shrubs, trees for town or village lots will be supplied. Norway Spruce for hedges or windbreaks will not be supplied by this Department. As may be inferred from Bulletin 209, the planting material sent out under this system is unfit for roadside or ornamental planting, but is intended to make forest plantations.

11. All applications for material to be supplied this spring (1914) must be in on or before the 31st of March, 1914. Applications will be filled in order of their arrival. Late applications may have to be held over till next season if the material is exhausted.

12. Upon applying to the Forestry Branch, Parliament Buildings, Toronto, the applicant will be furnished with a blank form for the purpose of describing the area it is proposed to plant, which should be carefully filled out and returned to the Department.

Since the inception of this work about 2,000,000 forest plants have been distributed throughout Older Ontario. The annual distribution now reaches about 400,000, and demonstration plantings on waste land have been made in nearly every county of Older Ontario.

In addition to the distribution of trees for waste land planting, the Branch sends out collections of evergreens to public schools carrying on school gardening, so that the children may become familiar with the propagation of forest seedlings.

### RAILROAD FIRE PROTECTION.

During this past season the Department has taken advantage of the Dominion Board of Railway Commissioners' General Order, to prevent fires along the right of way of railways coming under the jurisdiction of the Board.

The Board provides the legal measures to carry out fire protection and the Province through inspection and supervision sees that the Board's Order is fulfilled. The Provincial Forester was made Provincial Fire Inspector under the Board, with three District Fire Inspectors. The chief duties of these inspectors in carrying out the provisions of the Order, are as follows:—

To examine and report on locomotive equipment in relation to fire danger.

To report upon right of way conditions, in relation to fire hazard.

To supervise the disposal and burning of debris along the right of way.

To report all fires occurring along the right of way, giving cause and full description as far as possible.

The Text of the Board's General Order is contained in the following:—

#### DOMINION BOARD OF RAILWAY COMMISSIONERS (ORDER NO. 107).

2. Until further order, every railway subject to the legislative authority of the Parliament of Canada, under construction or being operated by steam, shall, unless exempted by a special order of the Board, cause every locomotive engine used on the said railway, or portion of railway, being constructed or operated by it, to be fitted and kept fitted with netting mesh as hereinafter set forth; namely:

(a) On every engine equipped with an extension smoke-box, the mesh shall not be larger than  $2\frac{1}{2} \times 2\frac{1}{2}$  per inch of No. 10 Birmingham Wire Gauge, and shall be placed in the smoke-box so as to extend completely over the aperture through which the smoke ascends, the openings of the said mesh not to exceed a quarter of an inch and one-sixty-fourth (that is, seventeen sixty-fourths) of an inch to the square.

(b) On every engine equipped with a diamond stack, the mesh shall not be more than  $3 \times 3$  per inch of No. 10 Birmingham Wire Gauge, and shall be placed at the flare of the diamond of the stack, so as to cover the same completely, the openings of said mesh not to exceed three-sixteenths and one sixty-fourth (that is, thirteen sixty-fourths) of an inch to the square.

#### 3. Every such railway company shall cause:

(a) The openings of the ashpans on every locomotive engine used on the railway, or portion of railway, operated or being constructed by it, to be covered, when practicable, with heavy sheet iron dampers; and, if not practicable, with screen netting dampers  $2\frac{1}{2} \times 2\frac{1}{2}$  per inch of No. 10 Birmingham Wire Gauge, such dampers to be fastened either by a heavy spring or by a split cotter and pins, or by such other method as may be approved by the Board.

(b) Overflow pipes from lifting injectors, or from water pipes from injector-delivery pipe, or from boiler, to be put into the front and back part of the ashpans and used from the first day of April to the first day of November, or during such portion of this period as the Board may prescribe, for wetting ashpans.

4. Every such railway company shall provide inspectors at terminal or divisional points where its locomotive engines are housed and repaired; and cause them, in addition to the duties to which they may be assigned by the officials of the railway companies in charge of such terminal or divisional points,

(a) To examine at least once a week,

- (1) The nettings;
- (2) Dead Plates;
- (3) Ashpans;
- (4) Dampers;
- (5) Slides; and

(6) Any other fire-protective appliance or appliances used on any and all engines running into the said terminal or divisional points.

(b) To keep a record of every inspection in a book to be furnished by the railway company for the purpose, showing:

- (1) The numbers of the engines inspected;
- (2) The date and hour of day of such inspection;
- (3) The condition of the said fire-protective appliances and arrangements; and
- (4) A record of repairs made in any of the above mentioned fire-protective appliances.

The said book to be open for inspection by any authorized officer of the Board.

(c) In case any of the said fire-protective appliances in any locomotive are found to be defective, said locomotive shall be removed from service and shall not (during said prescribed period) be returned to service, unless and until such defects are remedied.

(d) Every such railway company shall also make an independent examination of the fire-protective appliances on all the locomotives of such company, at least once each month, and the conditions of such fire-protective appliances shall be reported direct to the Chief Mechanical Officer of the railway company, or other chief officer, held responsible for the condition of the motive power of the said company.

5. No employee of any such railway company shall—

(a) Do, or in any way cause, damage to the netting on the engine smoke-stack or to the netting in the front end of such engine;

(b) Open the back dampers of such engine while running ahead, or the front dampers while running tender first, except when there is snow on the ground, and it is necessary to take such action in order to have engine steam properly;

(c) Or otherwise do or cause damage or injury to any of the fire-protective appliances on the said engines.

6. No such railway company shall permit fire, live coals, or ashes to be deposited upon its tracks or right of way, unless they are extinguished immediately thereafter, except in pits provided for the purpose.

7. No such railway company shall burn lignite coal on its locomotive engines as fuel for transportation purposes, unless otherwise ordered by the Board,—lignite coal consisting of and including all varieties of coal between peat and bituminous, with a carbon-hydrogen ratio of 11.2 or less, such ratio being based on analysis of air-dried coal.

8. Every such railway company shall establish and maintain fire-guards along the route of its railway as the Chief Fire Inspector may prescribe. The nature, extent, establishment and maintenance of such fire-guards shall be determined as follows:

(a) The Chief Fire Inspector shall each year prepare and submit to every such railway company a statement of the measures necessary for establishing and maintaining the routes of such railways in a condition safe from fire, so far as may be practicable.

(b) Said measures may provide for the cutting and disposal by fire, or otherwise, of all or any growth of an inflammable character, and the burning or other disposal of debris and litter, on a strip of sufficient width on one or both sides of the track; the ploughing or digging of land in strips of sufficient width on one or both sides of the track; and such other work as may, under the existing local conditions and at reasonable expense, tend to reduce to a minimum the occurrence and spread of fire.



(c) Said statements of the Chief Fire Inspector shall be so arranged as to deal with and prescribe measures for each separate portion of such railway upon and adjacent to which the fire risk calls for specific treatment. The intention shall be to adjust the protective measures to the local conditions and to make the expense proportionate to the fire risk and possible damage.

(d) Said statements of the Chief Fire Inspector shall prescribe dates on or within which the foregoing protective measures shall be commenced and completed, and the fire guards maintained in a clean and safe condition.

(e) No such railway company shall permit its employees, agents, or contractors to enter upon land under cultivation, to construct fire-guards, without the consent of the owner or occupant of such land.

(f) Wherever the owner or occupant of such land objects to the construction of fire-guards, on the ground that the said construction would involve unreasonable loss or damage to property, the company shall *at once* refer the matter to the Board, giving full particulars thereof, and shall in the meantime refrain from proceeding with the work.

(g) No agent, employee, or contractor of any such railway company shall permit gates to be left open or to cut or leave fences down whereby stock or crops may be injured or to do any other unnecessary damage to property, in the construction of fire-guards.

9. In carrying out the provisions of Section 297 of *The Railway Act*, which enacts that "the company shall at all times maintain and keep its right-of-way free from dead or dry grass, weeds and other unnecessary combustible matter," no such railway company or its agents, employees or contractors shall, between the first day of April and the first day of November, burn or cause to be burned any ties, cuttings, debris, or litter upon or near its right-of-way, except under such supervision as will prevent such fires from spreading beyond the strip being cleared. The Chief Fire Inspector or other authorized officer of the Board may require that no such burning be done along specified portions of the line of any such railway, except with the written permission or under the direction of the Chief Fire Inspector or other authorized officer of the Board.

10. The railway company shall provide and maintain a force of fire rangers fit and sufficient for efficient patrol and fire-fighting duty during the period from the first day of April to the first day of November of each year; and the methods of such force shall be subject to the supervision and direction of the Chief Fire Inspector or other authorized officer of the Board.

11. The Chief Fire Inspector shall, each year, prepare and submit to each and every railway company a statement of the measures such railway companies shall take for the establishment and maintenance of said specially organized force. Said statements among other matters may provide for—

(a) The number of men to be employed on the said force, their location and general duties, and the methods and frequency of the patrol.

(b) The acquisition and location of necessary equipment for transporting the said force from place to place, and the acquisition and distributing of suitable fire-fighting tools; and

(c) Any other measures which are considered by him to be essential for the immediate control of fire and may be adopted at reasonable expense.

12. Whenever and while all the locomotive engines used upon any such railway, or any portion of it, burn nothing but oil as fuel, during the aforesaid prescribed period, under such conditions as the Board may approve, the Board will relieve the said railway of such portion of these regulations as may seem to it safe and expedient.

13. Every such railway company shall instruct and require its sectionmen and other employees, agents and contractors to take measures to report and extinguish fires on or near the right-of-way as follows:—

(a) Conductors, engineers, or trainmen who discover or receive notice of the existence and location of a fire burning upon or near the right-of-way, or of a fire which



threatens land adjacent to the right-of-way, shall report the same by wire to the Superintendent, and shall also report it to the agent or persons in charge at the next point at which there shall be communication by telegraph or telephone, and to the first section employees passed. Notice of such fire shall also be given immediately by a system of warning whistles.

(b) It shall be the duty of the Superintendent or agent or person so informed to notify immediately the nearest forest officer and the nearest section employees of the railway, of the existence and location of such fire.

(c) When fire is discovered, presumably started by the railway, such sectionmen or other employees of the railway as are available shall either independently or at the request of any authorized forest officer proceed to the fire immediately and take action to extinguish it; provided such sectionmen or other employees are not at the time engaged in labours immediately necessary to the safety of trains.

(d) In case the sectionmen or other employees available are not a sufficient force to extinguish the fire promptly, the railway company shall, either independently or at the request of any authorized forest officer, employ such other labourers as may be necessary to extinguish the fire; and as soon as a sufficient number of men, other than the sectionmen and regular employees, are obtained, the sectionmen and other regular employees shall be allowed to resume their regular duties.

(e) The provisions of this section shall apply to all fires occurring within 300 feet of the railway track, unless proof shall be furnished that such fires were not caused by the railway.

14. Every such railway company shall give particular instructions to its employees in relation to the foregoing regulations and shall cause such instructions to be posted at all stations, terminals and section houses along its lines of railway. In case said instructions are not also carried in employees' time tables during said prescribed period, or in "operating" and "maintenance of way" rule books, they shall, previous to April 1st of each year, be re-issued to all employees concerned, in the form of special instructions. The Chief Fire Inspector may waive the above requirements in whole or in part, as to lines or portions of lines where, in his judgment, the fire danger is not material.

15. Every such railway company allowing or permitting the violation of, or in any respect contravening or failing to obey any of the foregoing regulations, shall, in addition to any other liability which the said company may have incurred, be subject to a penalty of one hundred dollars for every such offence.

16. If any employee or other person included in the said regulations, fails or neglects to obey the same, or any of them, he shall, in addition to any other liability which he may have incurred, be subject to a penalty of twenty-five dollars for every such offence.

17. The Board may, upon the application of any railway company or other party interested, vary or rescind any order or direction of the Chief Fire Inspector made pursuant to the provisions of this Order.

(Sgd.) H. L. DRAYTON,  
Chief Commissioner,  
Board of Railway Commissioners for Canada.

I have the honour to be, Sir,

Your obedient servant,

E. J. ZAVITZ,  
Forester.

The Honorable W. H. Hearst,  
Minister of Lands, Forests and Mines,  
Toronto, Ont.

*Appendix No. 39.*

## SUPPLEMENTARY LIST OF LICENSED CULLERS, 1913.

(For complete list see Minister's Reports 1911 and 1912.)

NAME OF CULLER.	Post Office.
Buchan, A. ....	Fort William.
Cameron, Ronald .....	Ignace.
Cole, J. E. ....	Kenora.
Currie, J. E. ....	Kenora.
Duncan, Edward J. ....	Sturgeon Falls.
Hammond, Henry .....	Dryden.
Love, B. ....	Port Arthur.
Marr, H. J. ....	Superior Junction.
McDonald, Thos. ....	Kenora.
Nash, John .....	Kenora.
Nesbitt, Thomas .....	Kenora.
Pehill, Walter .....	Dryden.
Robertson, J. D. ....	Kenora.
Richardson, C. R. ....	Fort Frances.
Sparling, S. W. ....	Richan.
Smith, L. G. ....	Worthington.

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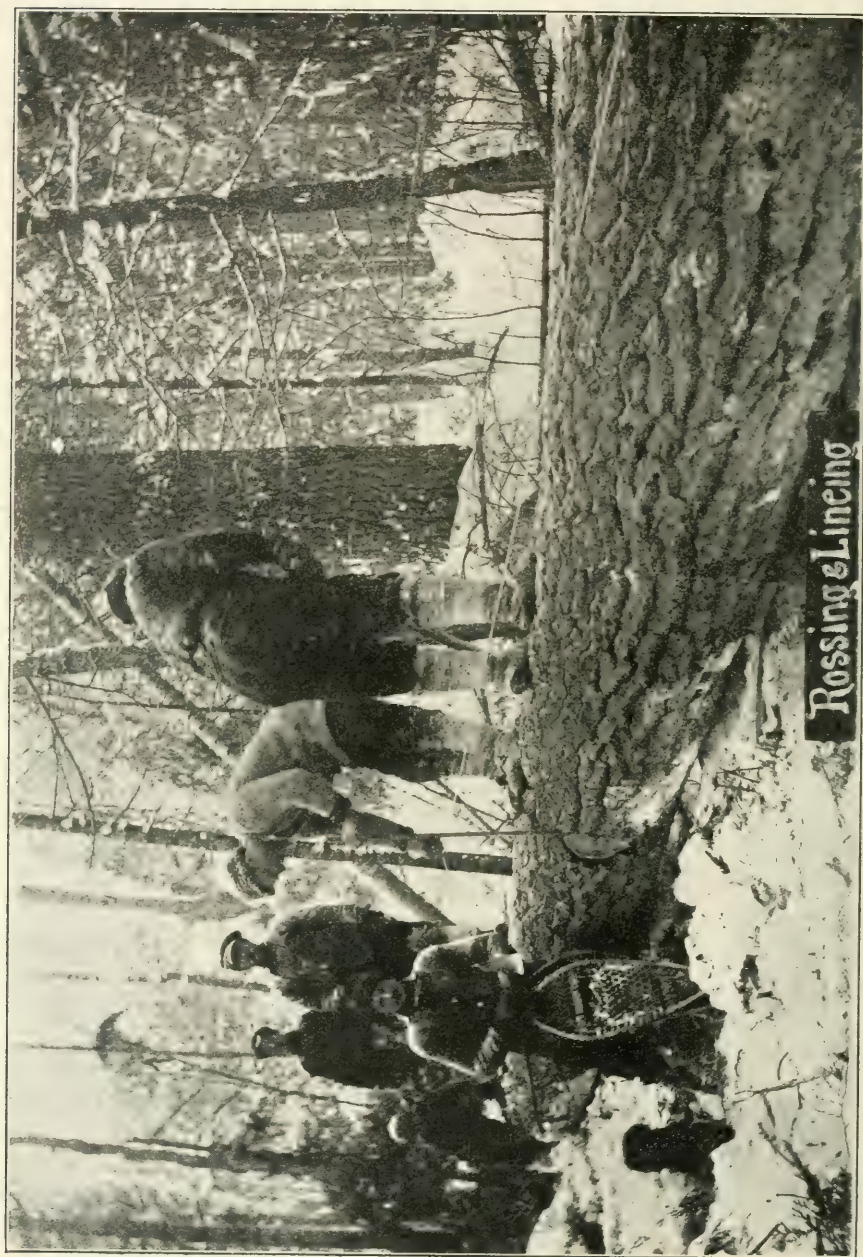
*Appendix No. 40.*

## MAKING SQUARE TIMBER.

Illustrations from photographs by W. D. Watt, North Bay.

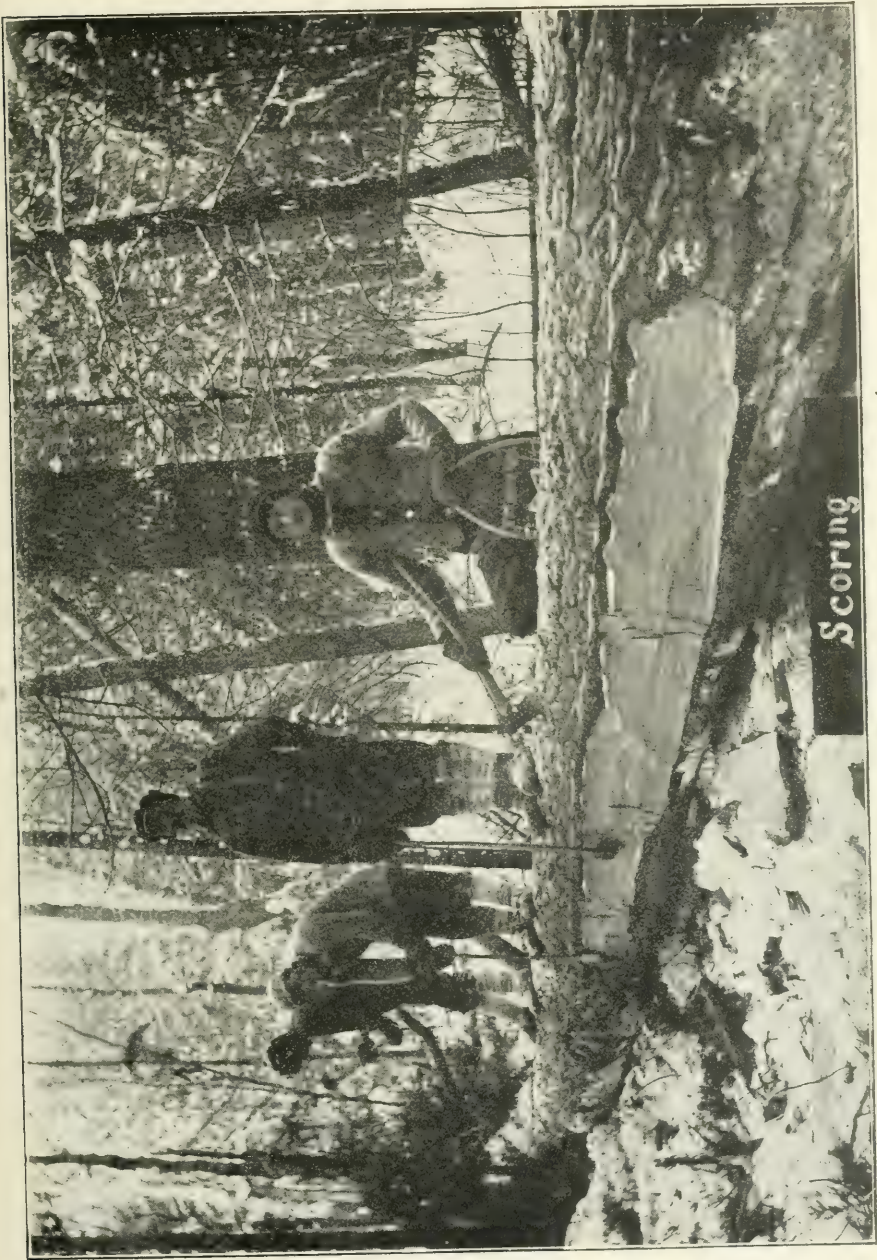






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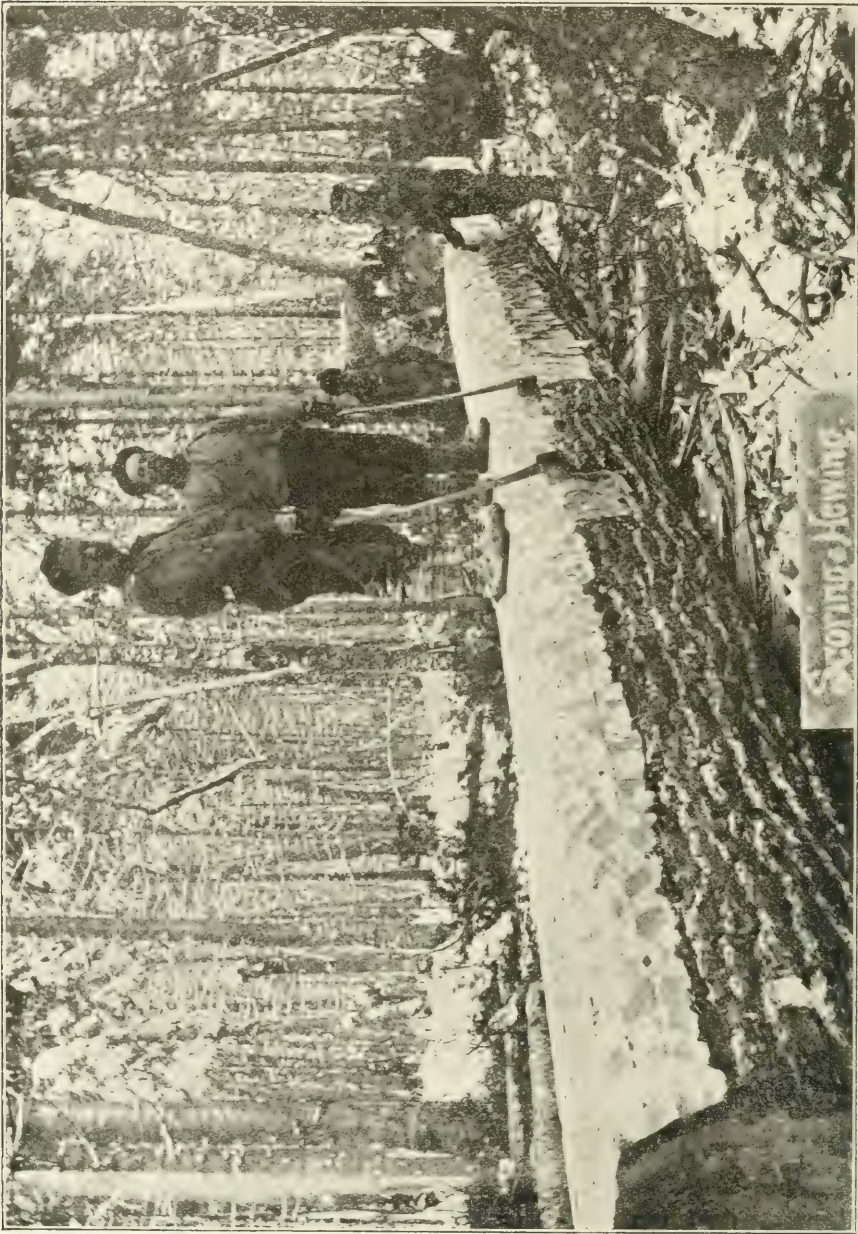




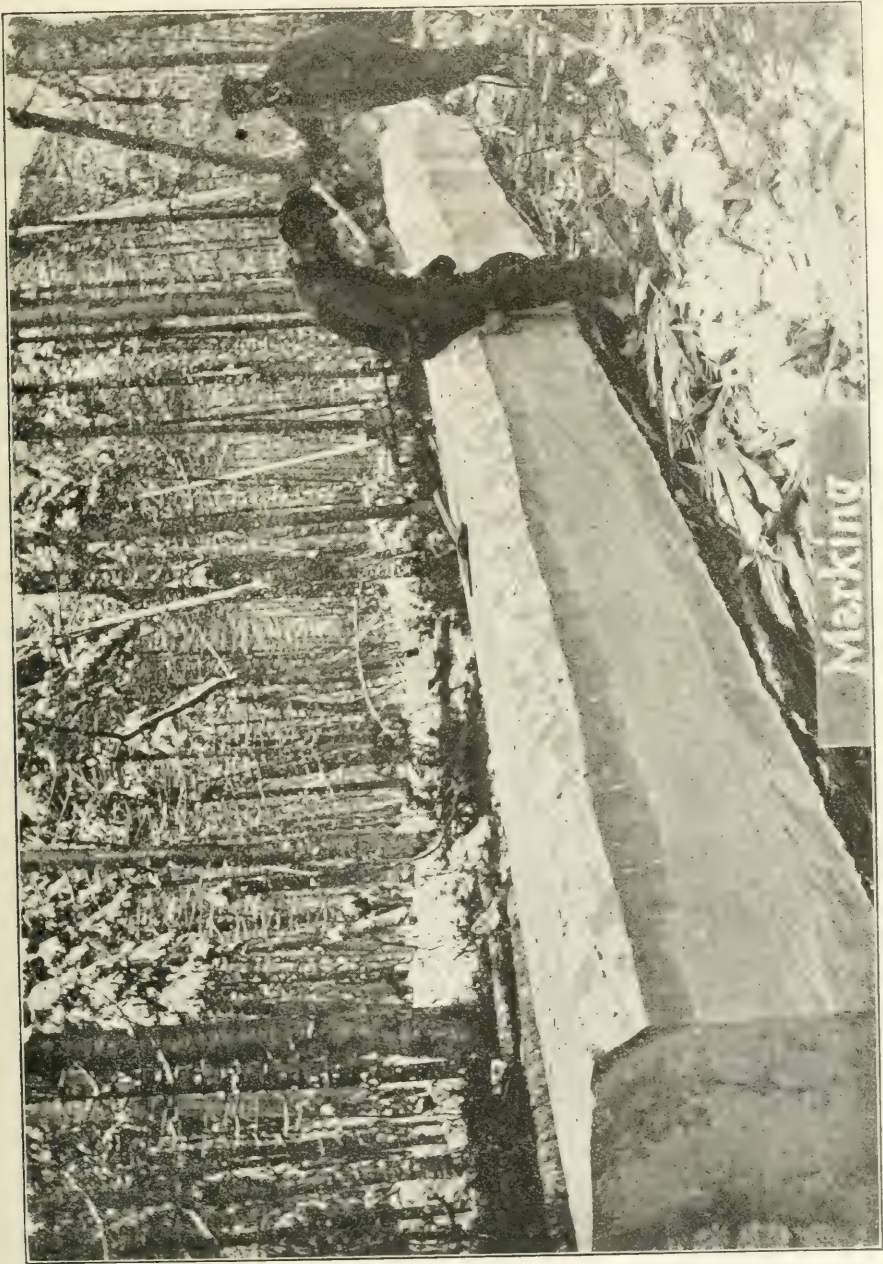


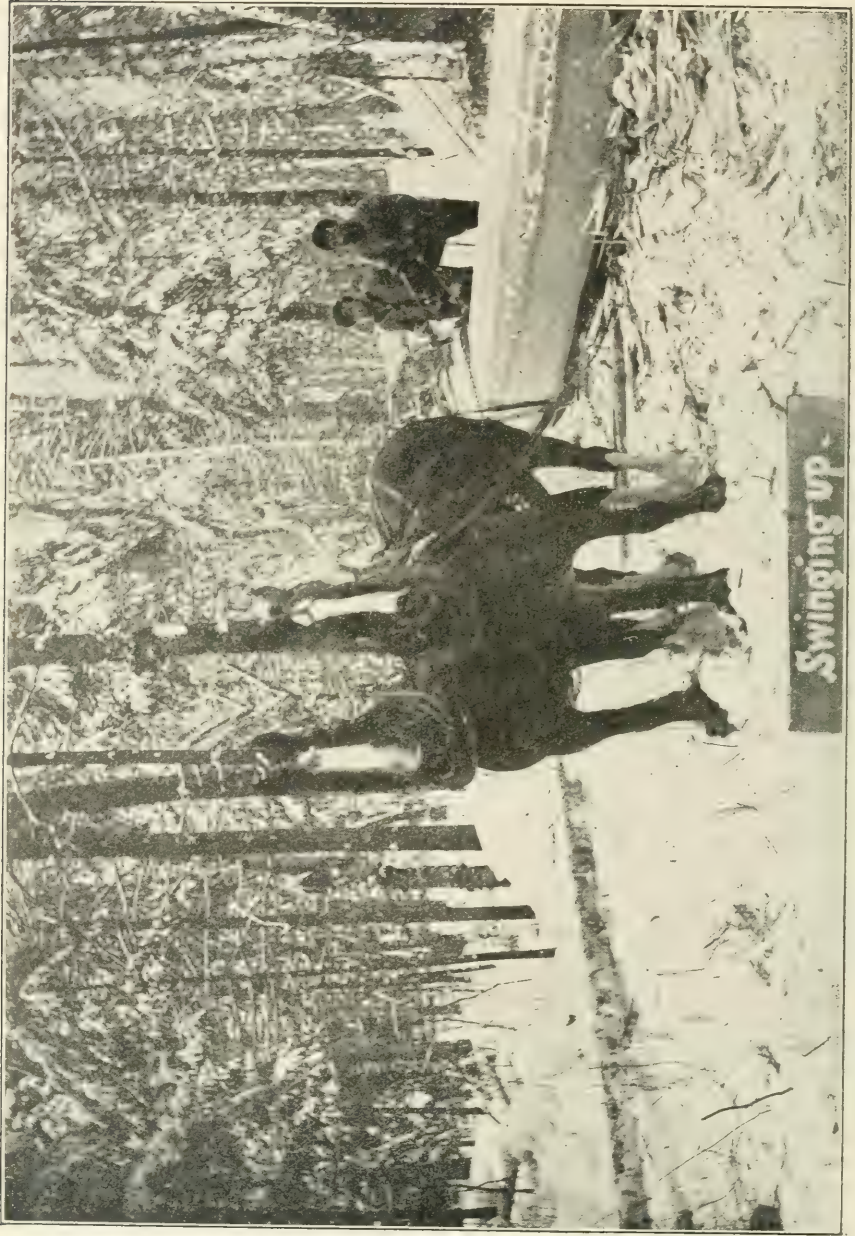




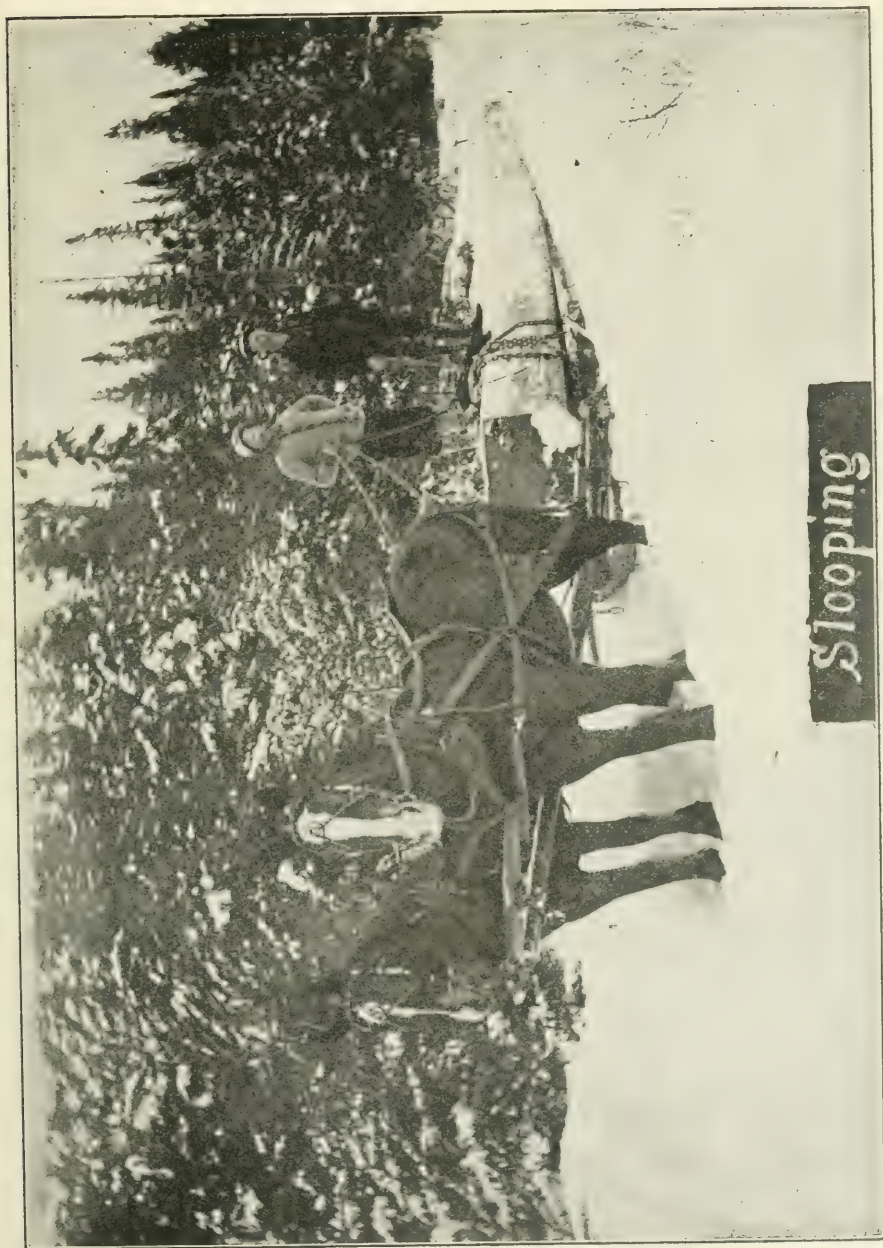




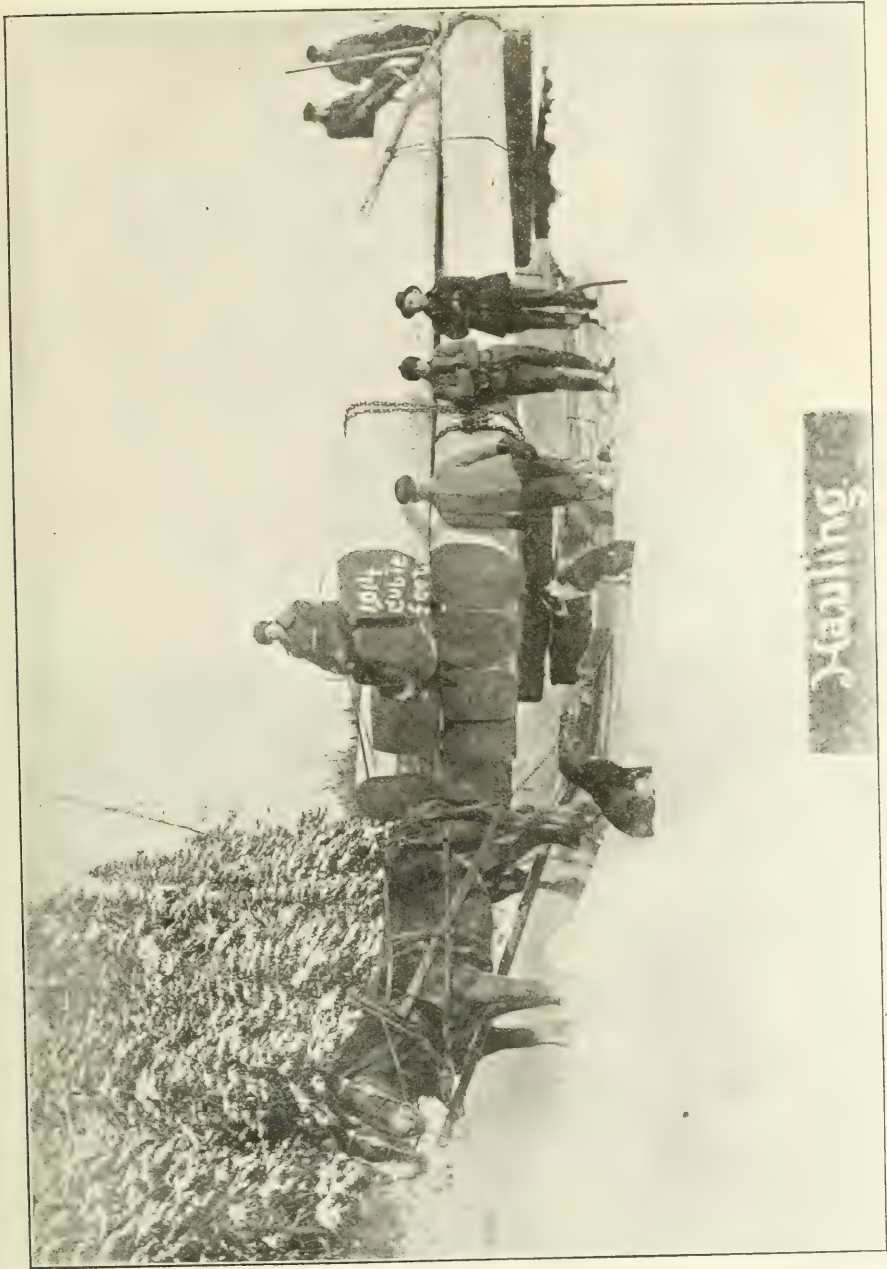






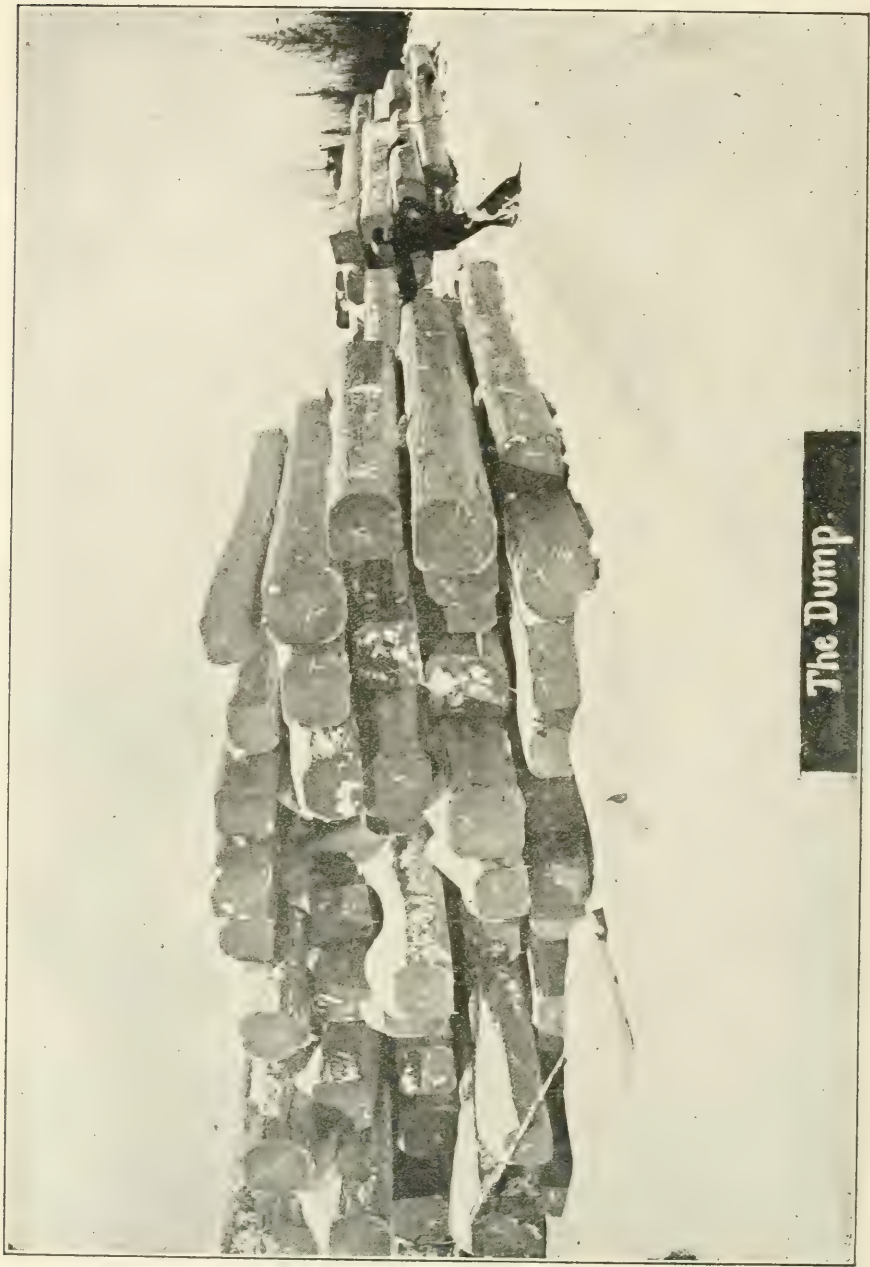




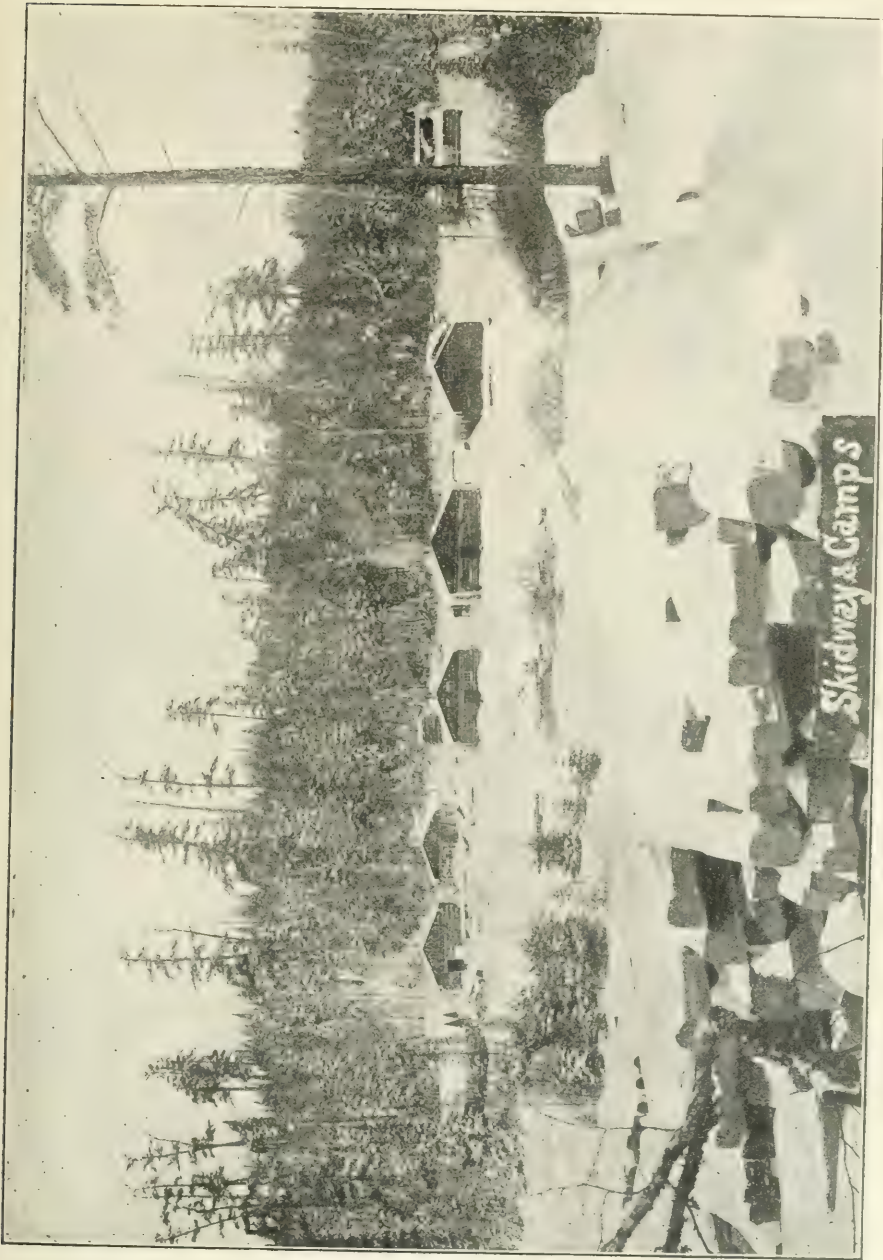


Logging









*Appendix No. 41.*

## REPORT ON THE CONSTRUCTION OF ROADS IN NORTHERN ONTARIO.

(Under the Provisions of 2 Geo. V., chap. 2.)

To the HONOURABLE W. H. HEARST,

*Minister of Lands, Forest and Mines.*

SIR,—I have the honor to submit a general report of the work done in the construction of roads in Northern Ontario for the season of 1913, in conformity with the Provisions of the Act 2 Geo. V., chap. 2.

Attached to this report is a description of the different works performed.

The season's work commenced in the latter part of April, except in a few instances where it was found profitable to construct bridges, and take out timber for crosslaying during the winter season.

The season was found very favorable for road construction, and considerable progress has been made. The operations extended from the Quebec boundary on the east to the Rainy River Valley and Keewatin on the west.

During the season, 76½ miles of road were constructed or partly constructed and improved. Of the total mileage, 500 miles were graded, part of the graded road being macadamized or re-surfaced; 279 miles of the total were cut out of the virgin forest.

A good deal of the work of the season of 1912 consisted in cutting out new roads, which, however, owing to the wet season it was found impossible to burn off. In 1913 all of these roads have been burnt off and many of them graded and ditched. Several of the roads cut out this season, although burnt off and suitable for winter traffic, have not yet been graded.

The sum of \$1,081,172.28 has been expended during the past year, up to the 31st of October, on the operations, thus making a total expenditure out of the \$5,000,000 loan of \$1,274,255.08.

As the operations extended over a very large area it was necessary to purchase a good deal of machinery and camp outfit to carry on the work. This machinery has been well cared for, and will serve for a good many years.

In the older sections the trunk roads as constructed were carefully selected where they could be made most permanent at the least cost; and where they would serve the greatest number of people, taking into consideration the newer sections which would be opened up later on. The old roads often followed the ridges or high land and were in many instances found crooked and unsatisfactory as to grades or drainage. These were straightened out, the grades modified, and special attention given to drainage; old culverts were replaced with more permanent ones; the materials used consisting of stone, corrugated iron pipe or durable wood where it could be procured. Swampy or low lands were well drained, corduroyed in places, and re-surfaced with gravel or stone. Many of the old bridges had to be renewed.

In the district of Temiskaming along the line of the Temiskaming and Northern Ontario Railway and its branches, and along the Grand Trunk Pacific Railway, east and west from the Town of Cochrane, it was found necessary, besides constructing trunk roads along the boundaries of townships and through

the centres, to construct a good many short roads in the interior of the townships, in order to give settlers who had located on their lands, and were making substantial clearings, an outlet to these trunk roads. This also was found necessary, inasmuch as there were few settlers, children had to walk long distances in order to reach a school, and many miles of road had to be made for that purpose.

I am glad to be able to report that the work of the season of 1913 appears to have given very much encouragement to the incoming settlers, and this last year has witnessed more *bona fide* work on the land by the settlers than I have previously observed for many years. I refer more particularly to the country in the vicinity of the town of Cochrane and along the line of the Temiskaming and Northern Ontario Railway from Cochrane south to Englehart and Earlton, and along the Charlton branch to Charlton. Large clearings with good substantial farm buildings are to be met with almost everywhere.

Along the roads constructed in 1913 most of the lots have been settled upon and small clearings made, and I have every reason to believe that if the work, as it is now being carried on, is continued for a few years there will be found in the Claybelt along the Temiskaming and Northern Ontario Railway and Grand Trunk Pacific Railway settlements as prosperous as are to be found in the district of Rainy River, or in the country in the vicinity of Haileybury and New Liskeard.

From my experience during the last two seasons in the construction of roads north of Englehart and over the height of land, I am the more fully confirmed in my opinion, and have not the smallest doubt of a successful future from an agricultural standpoint, for that district, provided that, as at present, settlement for the next few years is confined as far as practicable, to the most promising areas, so as to ensure large clearings whereby the climatic conditions may be improved. Little or no difficulty was met with in draining all the roads in the Claybelt which were graded and ditched last season. Much difficulty, however, is found in making permanent roads, for want of gravel or stone, which is seldom met with in that district.

In the valley of the Rainy River, which comprises an area of about three-quarters of a million acres of good agricultural land, I have found that sections are still unoccupied; and in other sections, during the last fifteen years the development which might have been expected has not taken place, owing in some measure to the want of roads. The continuation, however, for a year or two of the work commenced in 1913 will remove this difficulty, and I am confident that settlers will go into this district in the future in greatly increased numbers, as the land is nearly all of good quality.

On my first visit to the Rainy River Valley, over twenty years ago, I found the conditions there almost similar to those in the Claybelt to-day. The character of the country, its soil, and its climatic conditions are almost identical. It is in the same latitude, and to-day in the Rainy River Valley where settlement has taken place, and large clearings made, all kinds of grains and vegetables are produced in abundance. Summer frosts are almost of the past.

In the districts of Nipissing, Sudbury, Algoma, Thunder Bay, and Kenora, the trunk roads as constructed or improved will make it possible for the settlers to reach markets for their produce at all seasons of the year. Other roads are required in these districts to make it possible for the settlers in the out-lying sections to reach the main trunk roads. Several of the trunk roads as graded last season still require to be surfaced in places with gravel or stone. It was found impossible in one season to complete many of the roads.



The mining roads constructed into the Kirkland Lake Goldfields and the West Shining Tree Goldfields will give to the miners in those sections an opportunity of developing the several mining prospects opened up; the road from Iroquois Falls Junction on the Temiskaming and Northern Ontario Railway to the pulp mills at Abitibi River will give to the settlers in that vicinity an opportunity of hauling their pulp timber and other produce to the mills.

Fair progress has been made by the settlers in the vicinity of Cochrane both east and west therefrom. Already settlement has reached a point about nine miles north of the Grand Trunk Pacific Railway in the valleys of the Abitibi and Frederickhouse Rivers. Quite a settlement has taken place in the vicinity of Hearst at the junction of the Algoma Central and the Grand Trunk Pacific Railways, not only on the lands of the Crown but on the railway lands of the Algoma Central Company. Twenty-nine miles of road were cut out and part graded in this section.

Work was commenced at Ground Hog River on the Grand Trunk Pacific Railway 50 miles west of Cochrane. A few miles of trunk road were cut out along the railway, where a considerable settlement has already been made. This is one of the most promising areas in the Claybelt. At this point there is a large section of country which was burnt years ago and is now easily cleared. Vegetables of all kinds have matured here at the headquarters of the railway contractors.

Trunk roads have been constructed west of Cochrane as far as the township of Kendrey, the lands of the New Ontario Development Company on the Matagami River. This company is making good progress. Approximately 400 acres have been chopped and burnt over, of which 300 acres have been logged and fairly well drained. The following plant and machinery has been installed: A large saw mill with a capacity of 60,000 ft. B.M. per day, six rossing machines with a capacity of 50 cords of pulp wood per day and a first-class planing mill.

Sixteen private dwelling-houses have been erected for employees and settlers and two large boarding-houses with accommodation for 100 men. A general store has also been built, together with a post-office and a schoolhouse, the latter being used also as a church. Upwards of ten miles of a fairly good type of colonization roads have been constructed by the company.

In the descriptions of the several roads hereinafter given, information will be found respecting the operations in the various districts.

Accompanying the report is a statement of expenditure in the different districts and of the number of miles of road constructed or under construction.

I have the honor to be,

Sir,

Your obedient servant,

J. F. WHITSON,

*Road Commissioner.*



## 2 Geo. V. Chap. 2.

STATEMENT OF EXPENDITURE ON ROAD CONSTRUCTION, AND MILEAGE  
CONSTRUCTED,

FROM 23RD MAY, 1912, TO 31ST OCTOBER, 1913.

1912.	1913.
Total number of miles of new road cut out in 1912..... 210 miles (Of which were graded, 39 miles.)	New and old roads graded in 1913 . . . . . 500 miles
Old road improved ..... 23 miles	New and old roads partially graded . . . . . 40 miles
Total number of miles of road under construction, 1912... 233 miles	New bush roads cut out ready for grading and old roads improved ..... 224 miles
	Total number of miles of road under construction, 1913... 764 miles

In 1912 the total expenditure was along the Temiskaming and Northern Ontario Railway and branches; and along the Grand Trunk Pacific Railway, in the Districts of Temiskaming and Sudbury.

In 1913 the work was spread over all Northern Ontario, from the Quebec Boundary to the Manitoba Boundary; in the Districts of Nipissing, Temiskaming, Sudbury, Algoma, Thunder Bay, Kenora and Rainy River.

District.	Expenditure to 31st Oct., 1912.	Expenditure to 31st Oct., 1913.	Mileage constructed and under construction 1913.	Number of miles of bush road cut out.
District of Nipissing, North Bay to Mattawa .....		83,313 38	48	4
District of Temiskaming, Haileybury to Englehart, Matheson, Charlton, Swastika .....		185,612 61	150	50
District of Temiskaming, Cochrane, Porcupine, Iroquois Falls & Trans. Ry. from Quebec Boundary west 125 miles to Ground Hog .....	182,523 93	230,704 37	190	138
District of Sudbury, vicinity of the Town of Sudbury and West Shining Tree Mining District .....		118,568 32	72½	19
District of Algoma, vicinity of Hearst along G. T. P. Ry. and Junction of Algoma Central .....	3,866 71	18,529 61	29	29
District of Algoma, between Blind River and Sault Ste. Marie, on Sudbury & Sault Ste. Marie Rd. ....		76,275 40	35	.....
Thunder Bay, tributary to Port Arthur and Fort William .....		123,247 31	107	4
District of Kenora, vicinity of Kenora & Keewatin & N. W. ....		95,533 58	23½	12
District of Rainy River, in Rainy River Valley .....		135,031 31	109	23
General Administration Expenses .....	6,692 16	14,356 39	.....	.....
	\$193,082 80	\$1,081,172 28	764	279

## Summary of Expenditure:—

1912 . . . . .	\$193,082 80
1913 . . . . .	1,081,172 28

Total Expenditure ..... \$1,274,255 08

J. F. WHITSON,  
Road Commissioner.

ARTHUR E. D. BRUCE,  
Secretary and Accountant.

## ROADS IN RAINY RIVER VALLEY, DISTRICT OF RAINY RIVER, CONSTRUCTED IN 1913.

Number of miles of roads constructed or improved and regraded.....	109
Number of miles of ditches constructed .....	32½
Number of miles of tap or offtake drains constructed .....	9¼
Number of miles of road resurfaced with gravel .....	30
Number of wooden culverts constructed .....	202
Number of pile bridges constructed .....	12
Amount expended during 1913 .....	\$135,031 31



The beautiful banks of the Rainy River, west of Pinewood.

A trunk road was commenced at the town of Fort Frances opposite the site of the Hudson Bay Company's old post and continued westerly for 60 miles through the valley of Rainy River to near the town of Rainy River, where the Canadian Northern Railway crosses said river into the State of Minnesota, passing through the villages of Crozier, Lavalee, Devlin, Emo, Barwick, Stratton, Pinewood and Sleemen to Rainy River, crossing Indian Reserves Nos. 11, 12, and 13 at the Manitou and Long Sault Rapids. The road follows the best possible grades where it could be constructed at the least possible cost and at the same time where it would serve the greatest number of settlers.

The country passed through can be described in a general way as a first-class

agricultural section, the soil chiefly clay and clay loam, level or gently rolling with few rock outcrops. Here and there muskegs are met with or large tamarac swamps but all of them can with a reasonable amount of expenditure be drained and made good farm lands. Most of the valuable timber has in the last twenty-five years been cut off, either for railway ties, telegraph poles, piling or saw logs, in the townships within twelve miles of the Rainy River. Here and there an occasional farm is still well timbered, and in every instance there is sufficient timber left for fuel and for building purposes for the settlers for many years to come.

In 1897 and again in 1909 two very destructive fires swept over parts of the valley. The first fire crossed the river from Minnesota, near Stratton, and almost completely destroyed the timber on several townships in that locality. Later on, in 1909, a similar fire crossed the river from Beaudet and Spooner, on the American



Shevelin & Clarke's Saw Mills at Fort Frances. Capacity, 750,000 feet per day.

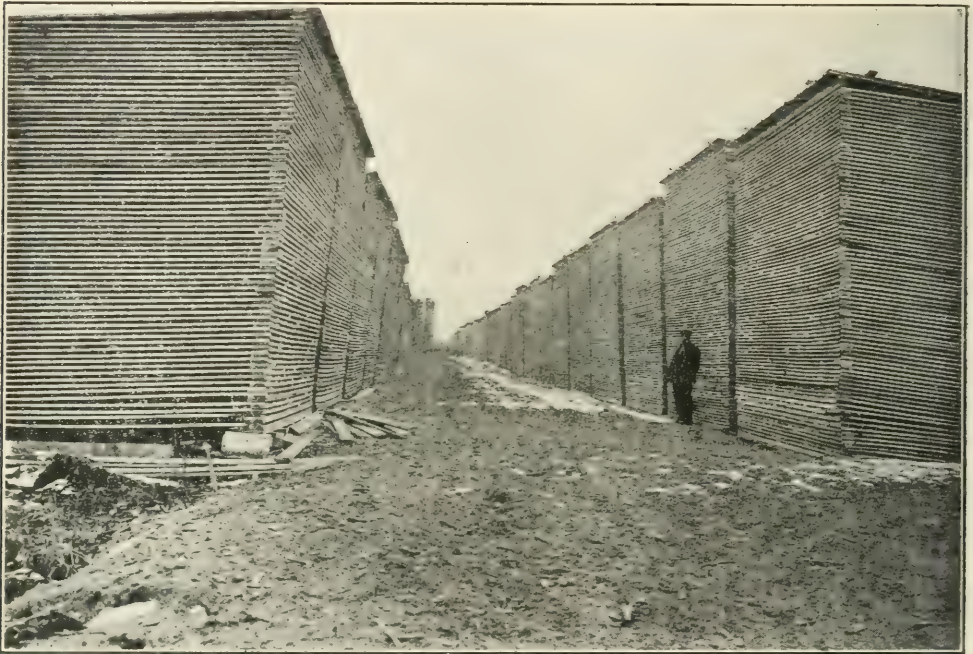
side, entering Ontario at the town of Rainy River and swept in a northerly and north-easterly direction over a very large area. Much of the country swept over by these two fires was left in a condition almost ready for the plough. The deep muskegs, before these fires occurred gave to the country the appearance that it would never be suitable for agricultural purposes; these swamp lands, owing to the burning of the muskeg, have had an opportunity of draining, and are now some of the best farming lands in the valley. Almost every lot along the Trunk Road between Fort Frances and Rainy River has been located. Large clearings have been made in many instances and first class buildings constructed, the country has every appearance of being a prosperous agricultural settlement.

These remarks apply to the townships fronting on the river and adjacent to the line of the Canadian Northern Railway. About twelve miles inland, however, from the river, the conditions are somewhat different, owing, to some extent at least, to the want of good roads. Large clearings and well cultivated farms are not very frequently met with in this section, notwithstanding the fact that the land



is of a first-class quality. A continuation for a few years of the work commenced last season will remove all difficulties in the matter of roads, and I am confident that settlers will go into this district in the future in greatly increased numbers.

During last season a trunk road was constructed from Lavallee on the Main Trunk Road south to Rainy River, a distance of six miles. From the town of Emo a trunk road was constructed north a distance of five miles, and from the town of Barwick a Trunk Road was constructed north six miles. From Pinewood a road was constructed north four miles, and from Sleeman a main trunk road was constructed from the railway to the Little Grassy River, a distance of 16¾ miles. This last mentioned road opens up a large section of first-class farming country in which fair progress has been made by the settlers. Several short roads were constructed in different places throughout the valley, where the settlers were



Shevelin & Clarke's Lumber Yard, Fort Frances. Quantity, 100,000,000 feet in December, 1913.

in most need of an outlet. All of these north and south trunk roads when extended further north will open up new sections and give to the present settlers a means of reaching a market on the Canadian Northern Railway which they have been long in need of.

Nearly all these roads have been well graded and ditched; thirty miles have been surfaced with gravel, 202 substantial wooden culverts of cedar and tamarac have been constructed and twelve pile bridges of the most durable material built; 9½ miles of tap drains had to be constructed in order to get the water away from the roads; 32½ miles of road ditches were dug of sufficient size to not only drain the road bed, but to assist the settlers in draining their lands, old roads where they were found too narrow were widened and reditched.

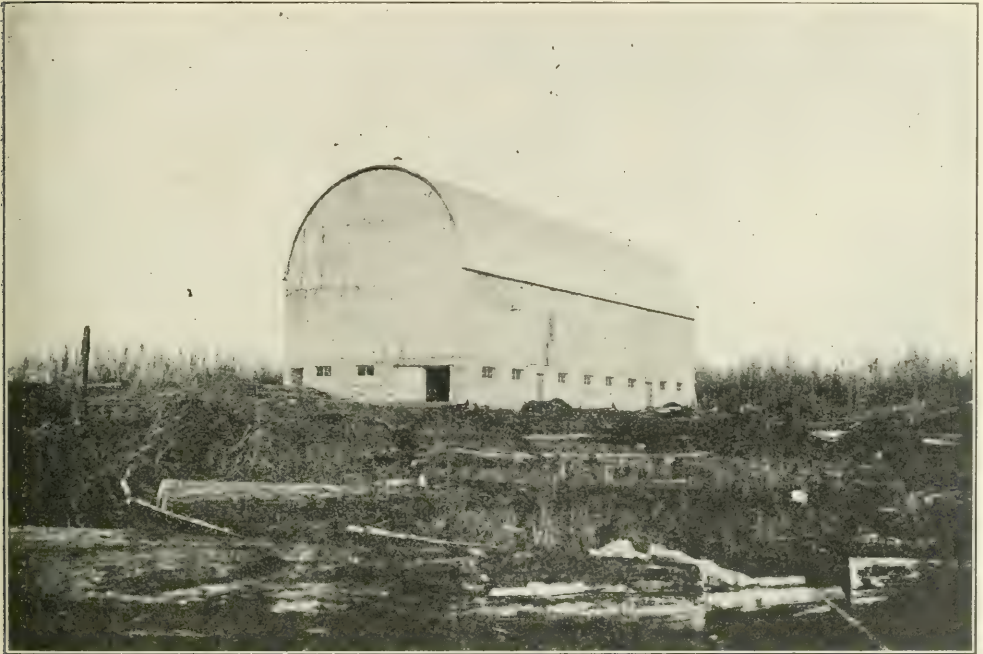
Following is a description of the various roads, on which was expended \$135,031.31.



## DESCRIPTION OF ROADS CONSTRUCTED.

## ROAD BETWEEN FORT FRANCES AND RAINY RIVER.

Road between town of Fort Frances and the town of Rainy River, commencing at the western boundary of the town of Fort Frances in Section 30, township of McIrvine, thence westerly along the old River Road 1,640 feet. From here a new road was built, running west 6,575 feet to the east boundary of Section 24, Township of Crozier; thence south 900 feet to the north-east corner of Section 13, Crozier; thence west 3 miles on old road along the north boundary of sections 13, 14 and 15, thence north one mile to the north-east corner of section 21; thence west 7 miles to the north-east corner of section 20, Township



Mr. Crawford's New Barn, north of Emo, Township of Carpenter. Concrete foundation; length, 106 ft.

of Devlin; thence north one mile to the north-east corner of section 29, Township of Devlin; thence west 7 miles to the north-east corner of section 30, Township of Lash; thence south half a mile to the village of Emo. This road has all been graded and well ditched from Fort Frances to Emo. Between these towns,  $3\frac{1}{2}$  miles of new road were cut out, graded and ditched. The remainder followed the old road which in many places was so narrow that two teams could barely pass. These ditches had to be reconstructed.

Along this road twelve and a half miles of ditches and two and a half miles of tap drain were dug. Fifty-four culverts and a pile bridge sixty-one feet in length across the La Vallee River at La Vallee, were built. Seven and a quarter miles of this road were surfaced with gravel. The remainder of the gravelling was left to be completed after the freeze-up when the work could be done at less cost, as the roads in the fall were very wet and would cut up badly

if heavy loads were drawn on them. Eleven miles of this road still requires in places gravel, to make a first class road between Fort Frances and Emo.

This road passes through a fine farming district, the soil being principally clay or clay loam with a few spruce swamps. all of the land has been taken up by settlers, most of whom have good buildings erected. One mile west of Fort Frances commences a swamp running along the trunk road a distance of two miles. This is the only large swamp passed over until within three and a half miles of Emo where the road again crosses a swamp for two miles. In both of these swamps there is good drainage.

The timber is small, practically all suitable for lumber having been cut or burnt off by the fires which have overrun the country. The timber found is mainly spruce, tamarac, poplar, birch and balm of gilead.



The Banks of the Rainy River between Emo and Barwick.

The next section of the trunk road is between Emo and the town of Rainy River, a distance of thirty-eight miles, described as follows:

Commencing at the Village of Emo, thence north-westerly to the east boundary of section 36 in the Township of Barwick, one mile; thence westerly along an old colonization road to east boundary of Indian Reserve number 11, one mile and 14 chains, thence almost in a direct line across the Indian Reserve through a beautiful farming country badly burnt over in places, a distance of three and a quarter miles to west boundary of said Indian Reserve, then N. 77, 20 W. 33.36 chains, then N. 65 49 W. 6.39 chains thence westerly along north boundary of river lot 38 31.09 chains thence westerly along the north boundary of section 31 Township of Barwick, one mile to Barwick Station on the Canadian Northern Railway and close to the village of Barwick, thence continuing westerly along south boundary of sections 1 and 2, Township of Shenston 2 miles, thence north

along east boundary of section 3, 2,871 feet to the southern limit of said railway, thence westerly along said railway 5 miles and 426 feet across Indian Reserves 12 and 13. Both these Indian Reserves have been almost entirely swept by the forest fire of 1897. The greater portion of Number 12 and the eastern and southern portions of number 13 is fine agricultural land. In the western portion there is a large muskeg which will require considerable draining. After crossing the Indian Reserve, the road then follows along the northern boundary of sections 12 and 11, township of Morley for one mile, 1,498 feet: thence northerly along east boundary of sections 15 and 22, 2 miles, passing through the town of Stratton and crossing the Canadian Northern Railway to the north side, half a mile north of the south-east angle of section 15. The road then turns west for five miles along the north boundary of sections 22, 21, 20, 19 and 18, thence



Surfacing a Semi-Muskeg Road with Gravel. Part of the Little Grassy River Road, Rainy River Valley.

northerly 2,600 feet along east boundary of section 26, Township of Dilke thence westerly along old colonization road 5 miles, passing through the village of Pine-wood; thence northerly 2,600 feet along east boundary of section 36, township of Worthington, thence westerly along the north boundary of the townships of Worthington and Atwood a distance of 9 miles to the town of Rainy River.

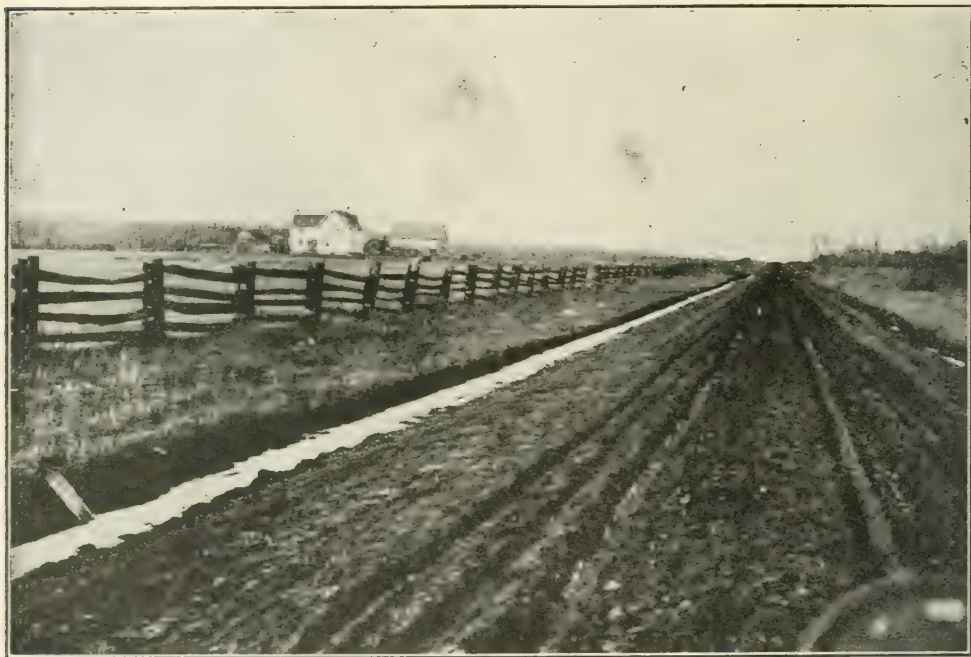
Along this road 16 miles of new road were cut out, 13 miles of which were graded, leaving 3 miles of new road to be graded next season, also 5 miles of old road should be graded next season before being gravelled. Sixty-two culverts and seven pile bridges were built, two and a quarter miles of tap drain were dug and seven miles of the road gravelled. Twenty-five miles of this road should



be gravelled to give a continuous gravelled road from Emo to Rainy River. The most of this gravel will have to be hauled by train as there are only a few good gravel pits close to this road. Twenty-five miles of this road was graded and three and a half miles cleared ready for grading, during the present season.

This road runs through a fine belt of clay land from Emo to Stratton. Between Stratton and Rainy River the road crosses six miles of swampy land, the remaining thirteen miles being good clay land. The high land has all been taken up and considerable of it cultivated.

Between Barwick and Stratton the road is all graded two miles of which were gravelled, the remainder being ready for gravelling. Between Stratton and Pinewood there remains one and one-half miles of new road to be ditched and two miles of old road to be graded before this road is ready for gravelling.



On the Fort Frances and Rainy River Trunk Road, near Stratton, before surfacing with gravel.

Between Pinewood and Sleeman there remains one and one-half miles of new road to be graded. Two and a half miles of gravelling will complete this road. Between Sleeman and Rainy River two miles of old road should be graded and four miles gravelled.

#### ROAD FROM SLEEMAN TO LITTLE GRASSY RIVER.

This road has a total length of sixteen and three-quarter miles, described as follows:

Commencing at the trunk road at the village of Sleeman thence northerly a distance of seven miles to the north-east corner of section 34 in the township of Blue thence diagonally across lots 5 and 6, Con. 1, township of Pratt to the north-east corner of lot 5, Con. 1, one mile and 1.109 feet. thence north 5 miles between lots 4 and 5 to the north boundary of the township of Pratt, thence



easterly one mile to the north-east corner of lot 3, township of Pratt, thence northerly two miles and 2,491 feet between lots 2 and 3, township of McCrossen to the bridge across the Little Grassy River.

On this road 17 miles of ditches and one mile and 600 feet of tap drain were dug, 32 culverts and two bridges were built, 10 miles of road gravelled and Sleeman's Creek cleaned out for one mile to give a good outlet to the water from the ditches. The road was graded its entire length. Four miles of this road is new road.

For the first twelve miles along this road fifty per cent. of the land is low, beyond the twelve miles the road passes through a fine belt of clay land where previous to the building of this road the settlers only had a winter road to the railway.

The large timber has nearly all been cut, but considerable cedar posts and poles are taken out each winter by the settlers. The principal timber found are the poplar, cedar, birch, tamarac and spruce. Most of these trees are of small size but there still remains a considerable quantity of good cedar and large poplar.



The Fort Frances Water Power on Rainy River, showing the Ontario and Minnesota Power Company's Power Houses and Pulp and Paper Mill on the Ontario side of the river.

#### ROAD IN THE TOWNSHIP OF DILKE.

One-half mile of road was graded and gravelled south from the trunk road between river lots 24 and 25. This road was built to enable us to haul gravel to the trunk road. It passes through a good farming district.

#### NORTH PINWOOD ROAD IN THE TOWNSHIP OF NELLES.

This road is a continuation of the road running north from the village of Pinewood. Commencing at the north-east corner of section 3, township of Nelles, thence north four miles to the north-east corner of section 26, Nelles.

Along the east boundary of section 3 and 10 a single ditch was dug alongside of old road and the excavation spread to grade on the old road bed. On the east  
10 L.M.

boundary of section 15, eighteen hundred feet of new road, one culvert and a pile bridge 46 feet in length were built. On the east boundary of section 22 one mile of new road was built. On the east boundary of section 27 one mile of single ditch was dug and the road grubbed and cleared. On this mile another ditch should be dug on the opposite side of this road. The total length of this road is 4 miles and it was built with the intention of continuing it to the Big Grassy River country.

Land along this road is mostly swampy; all of the high land has been settled on, and the settlers have been very much handicapped by poor roads. This road will open up a good country to the north if continued. The timber found is small spruce, tamarac, poplar and birch.



A Group of School Children and Teacher in the Rainy River Valley.

#### BARWICK ROAD NORTH ALONG SHENSTON AND DOBIE TOWN LINE.

Commencing at the south-east corner of the township of Shenston, thence northerly 6 miles along the town line.

This road was graded its entire length. Five culverts and 1,095 feet of tap drain were built. This road passes through an excellent farming district, well settled.

#### ROAD ON NORTH BOUNDARY OF TOWNSHIP OF TAIT.

Commencing at the north-east corner of section 35, township of Tait, thence westerly along the north boundary of this township, two and one-quarter miles. This road has been cleared and grubbed but not graded.

#### ROAD IN TOWNSHIP OF SHENSTON.

Commencing at the south-east corner of section 2, township of Shenston, thence northerly a distance of 2,858 feet along east boundary of section 2. This

road was gravelled its entire length and one culvert built. It was made for hauling gravel to the trunk road. It passes through good farming country.

#### CARPENTER AND DOBIE TOWN LINE.

Commencing at the trunk road on the townline between Barwick and Lash, thence northerly 5 miles along the townline between Barwick and Lash and along the Carpenter and Dobie townline.

Along this road 3,310 feet of tap drain were dug, 17 culverts and one bridge 33 feet in length were built. The road was graded its entire length. This road passes through a good farming district. The soil is clay or clay loam. The land is all taken up and improved.

#### CROZIER AND DEVLIN TOWN LINE.

Commencing at the north-east corner of section 24 in the township of Devlin, thence northerly along the Crozier and Devlin townline one mile and a half.

The road was graded one mile north from the trunk road the remaining half mile being cleared and grubbed ready for grading. Two culverts and 600 feet of tap drain were built.

This is a new road and gives an outlet to a number of settlers who did not have a road before to town. The soil is a heavy clay. All of the land along this road is settled.

#### DEVLIN ROAD, TOWNSHIP OF BURRISS AND DANCE.

Commencing on road between lots 8 and 9, township of Burriiss 2,400 feet south of the north boundary of Burriiss, thence northerly 2,400 feet between said lots, thence northerly two miles between lots 8 and 9 township of Dance. There was also a road built running easterly along the north boundary of lots 8 and 7, Con. 6, Burriiss one mile.

Between lots 8 and 9 Burriiss, 2,400 feet of old road was grubbed and graded. Between lots 8 and 9 concessions 1 and 2 Dance, a new road was cleared two miles. In Con. 1 three-quarters of a mile of road was graded and the grubbing completed to the end of the mile. Six culverts and 3,080 feet of tap drain were built. Along the north boundary of lots 8 and 7 Burriiss one mile of road was cleared 66 feet in width and 1,230 feet of road graded.

This road should be completely graded next season and the road continued north another two miles to give an outlet to the settlers located there.

The land is clay and spruce swamp and is all settled on and partly cleared and cultivated.

#### LA VALLEE ROAD.

Commencing at the Canadian Northern Railway track at the village of La Vallee thence southerly five and a half miles to the old river road thence easterly along said road a distance of three miles.

Six miles of this road was practically new road the remainder being old road which we regraded. This road has been graded its entire length, but the new road should be gone over next season with the grader to smooth it down as the grade was wet when built and it was impossible then to make a smooth road. 22 culverts and 9,700 feet of tap drain were built on this road.



This road passes through a fine belt of clay land and is all settled and considerable of it under cultivation. The timber found is small being chiefly spruce, tamarac, birch and poplar.

#### CROZIER ROAD.

Commencing at the trunk road on the east boundary of section 20, township of Crozier, thence south 1,000 feet to the Canadian Northern Railway.

This road was graded, one culvert repaired, and 300 feet of tap drain dug.

#### ROAD IN TOWNSHIP OF CROZIER.

Commencing at the trunk road at the north-east corner of section 21, township of Crozier thence one mile easterly on the north boundary of section 22.

This road was cleared the full width of 66 feet. The country is swampy; the first quarter of a mile is good clay land.

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### ROADS CONSTRUCTED IN THE PORT ARTHUR DISTRICT, TRIBUTARY TO THE CITIES OF PORT ARTHUR AND FORT WILLIAM, DURING THE SEASON OF 1913.

Amount expended, \$123,247.31.

Number of miles of road cut out and old roads improved and graded, 107.

The following roads were cut out, improved and graded during the season of 1913:

#### DAWSON ROAD.

Commencing at the north-westerly limit of the city of Port Arthur thence north-westerly 18 miles to the crossing by the Grand Trunk Pacific and the Canadian Pacific Railways near the Kaministiquia River.

#### DOG LAKE ROAD.

Commencing at a point on the Dawson Road about four miles west of the limit of the city of Port Arthur, thence northerly toward Dog Lake. Work was completed on this road four miles.

#### JOHN STREET ROAD.

Commencing at the westerly limit of Port Arthur, thence west to the Kaministiquia River a distance of 14½ miles. The last half mile of this road was not completed as the crossing point on the Kaministiquia River has not yet been decided upon.

#### OLIVER ROAD.

Commencing on the westerly limit of Port Arthur thence west 17 miles to the Kakabeka Falls, together with a diversion of 1½ miles to the dam across the same river.



## OLIVER AND McINTYRE TOWNSHIP ROAD.

Commencing at the Oliver Road and extending north between townships of Oliver and McIntyre 6 miles.

## ARTHUR STREET ROAD.

Commencing at the west limit of the city of Fort William thence west to Kakabeka Falls, together with a branch road running south-westerly crossing the Kaministiquia River at the village of Stanley and proceeding south-westerly along the White Fish River Valley to Hymers, a distance of 21 miles in all. The work performed consisted in widening, clearing, grading and placing culverts.



On the Old Dawson Road, ten miles west of Port Arthur, showing 40 years' growth of White Birch.

## PIGEON RIVER ROAD.

Commencing at the southerly limit of Fort William, thence south-westerly to and following the Slate River Valley, passing the front of the Prison Farm and southerly towards the International Boundary, at a point on the Pigeon River where a trunk road now being constructed in the State of Minnesota will also end. The work was performed on this road for a distance of 20 miles.

## SCOBLE AND PEARSON ROAD.

Commencing at a point on the Pigeon River road where the latter turns south from the north limit of the township of Blake, thence west along the north limit of that township and south along the west limit of the said township, to a trunk road constructed by the municipality of Pearson township, and beginning again at a point on said trunk road where the line between lots 6 and 7 intersects it; thence south 2 miles; thence west 1 mile to another trunk road similarly constructed. Work was performed on these roads for a total distance of 6 miles.

On all the old roads improved, the stumps, etc., were cleared away and burned for a width of 66 feet, all boulders and stones, stumps and roots were removed from the central 40 feet, culverts of corrugated iron, stone or durable



The Fort William and Duluth Trunk Road passing the Provincial Government's Prison Farm, south-west of Fort William.

wood were built at all stream or water course crossings. The steep pitches and grades were modified by excavation. All low-lying portions of the roadway were built up by borrowing earth from the sides or from adjacent high ground. A roadway 28 feet in width having well constructed ditches on each margin was formed having a crown of 2 feet at its centre above the ditches. Graders hauled by horses and a large grader hauled by a traction engine were used in the work.

The old roads were often merely a waggon width track, closely hemmed in, in places by trees and undergrowth, with many roots, stumps and boulders in the roadways. They followed along the road allowances, but were very crooked and little or no work had been done to modify the steep pitches at stream crossings and hills. Drainage was insufficient, and in many instances the old ditches were so close to the travelled portion of the road that it was dangerous for vehicles to pass. These roads had to be widened, the old ditches filled in and new ones constructed. Gravel suitable for road purposes was difficult to procure.

## DAWSON ROAD.

The work was begun at the west limit of the city of Port Arthur. The road was cleared to the full width of 66 feet for the first ten miles then 40 feet in width the remaining  $7\frac{1}{2}$  miles to the Canadian Pacific Railway near the Kaministiquia River. All stumps, stones and debris were cleared from off the central 40 feet of the right of way. Wooden, stone and four corrugated iron culverts were built in place. The grading was completed for  $11\frac{1}{2}$  miles.

## OLIVER ROAD.

Cleared 66 feet in width for 17 miles to the falls, also a branch running to the dam site on the Kaministiquia River about  $1\frac{1}{2}$  miles. Stones, stumps, etc., removed from the central 40 feet. Wooden, stone and 45 corrugated iron culverts built in place. The grading and ditching completed for 18 miles.

## OLIVER AND MCINTYRE TOWN LINE.

Cleared 66 feet in width for 6 miles, and stones, stumps, etc., removed from the central 40 ft. Wooden and stone culverts built in place. Grading begun at John Street and completed south one mile, also begun at Dawson Road and completed south 2 miles. All ditching completed. Part of this road still requires to be graded.

## ARTHUR STREET ROAD.

Cleared 66 feet in width for 21 miles; stones, stumps, etc., removed from the central 40 feet, and wooden, stone and 18 corrugated iron culverts built in place. Grading completed to Kakabeka Falls and on the branch road across the Kaministiquia River at Stanley and south-westerly  $2\frac{1}{2}$  miles.  $18\frac{1}{2}$  miles of grading done. The entire road well ditched. A diversion of  $2\frac{1}{2}$  miles long from the former road south-west of Stanley was begun where grading ceased. This  $2\frac{1}{2}$  miles was cleared out, stumped, etc., and made fit for a winter road. The diversion was made in order to avoid a steep hill on the old road. This joins the former road again and follows the same for about  $1\frac{1}{2}$  miles. There a further diversion required to be made to a point on the former road near Hymers, thence it should run through the township of O'Connor.

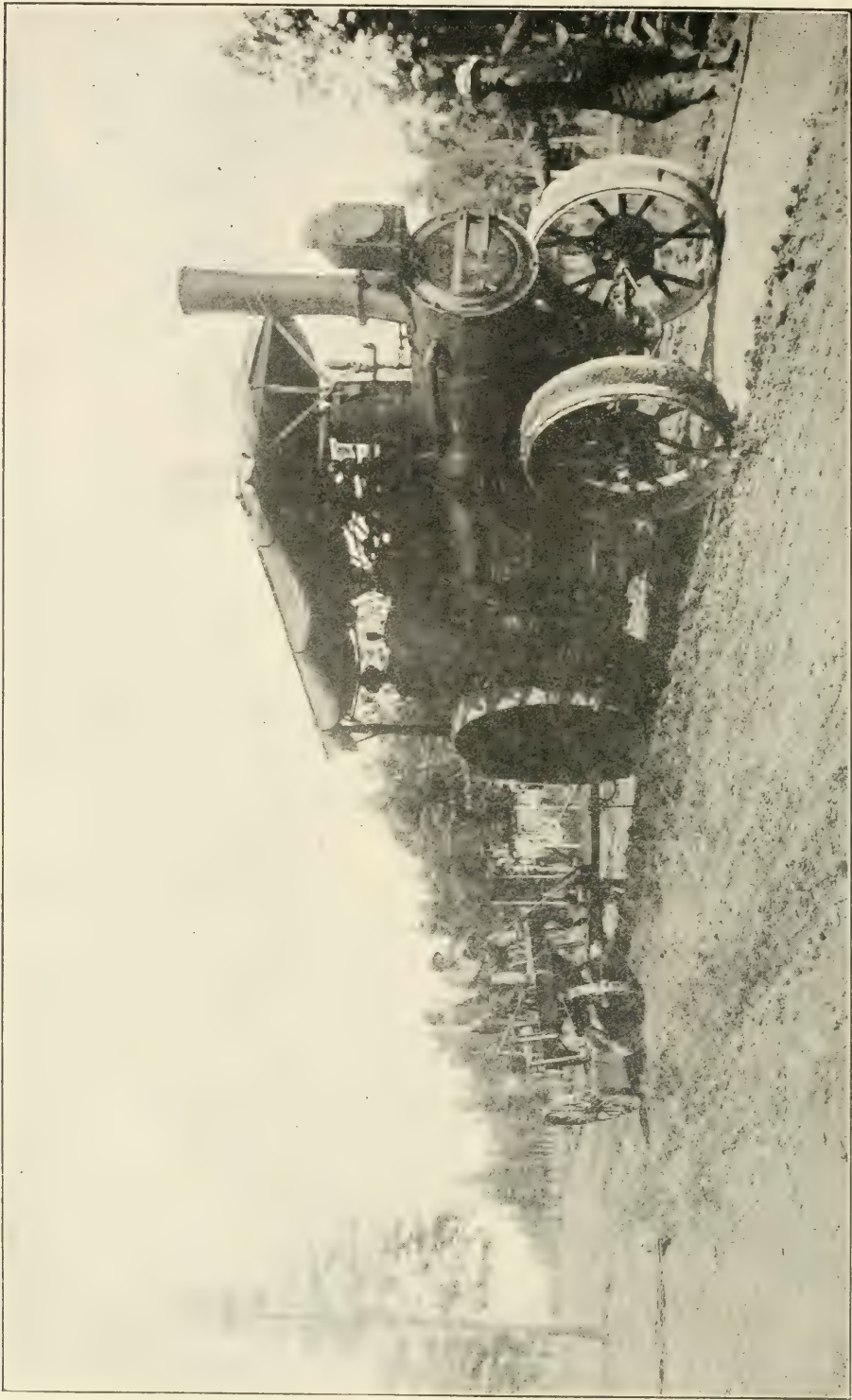
## PIGEON RIVER ROAD.

Cleared 66 feet in width for 20 miles, stones, stumps, etc., removed from the central 40 feet. Wooden, stone and 96 corrugated iron culverts built in place. Grading completed for 14 miles with the exception of 2 hill cuttings and one fill to be completed. Ditching completed for 14 miles. This road may be extended to the International boundary to connect with the state road from Duluth to the Pigeon River, which is now partially completed from Duluth to within a mile or two of the river.

## SCOBLE AND PEARSON ROAD.

Cleared 66 feet in width for 4 miles, stones, stumps, etc., removed from the central 40 feet, and stone and 41 corrugated iron culverts built in place. Grading completed for 4 miles with the exception of a fill 300 feet in length which has been cross-laid. This part of the road lies on the town line between





Grading on the Oliver Road, west of Port Arthur.



the township of Blake and Paipoonge one mile, and between the townships of Blake and Scoble three miles, connecting at its southerly end with a trunk road already constructed by the township of Pearson. Road between lots 6 and 7 township of Pearson cleared 66 feet in width for two miles, stones, stumps, etc., removed from central 40 feet. Wooden culverts and bridge over the Slate River built. Road made fit for winter travel. This part of the road begins at the above mentioned trunk road and runs south 2 miles thence west 1 mile to join a second trunk road constructed by the municipality. This road may be extended south along the line between lots 6 and 7 to join the Port Arthur Duluth International road.

#### DOG LAKE ROAD.

Work begun late in season, at Dawson road. Cleared 40 feet in width for 4 miles. Stones, stumps, etc., removed from central 25 feet of clearing for 4 miles. Wooden and stone culverts built in place for  $3\frac{1}{2}$  miles. Grading and ditching completed for  $2\frac{1}{2}$  miles. At a point about  $2\frac{1}{2}$  miles from the Dawson Road a diversion of the former road was begun and was laid out for  $2\frac{1}{2}$  miles when it again joined the former road. This was cleared and stumped and made fit for a winter road but was not graded nor completely ditched.

#### JOHN STREET ROAD.

Cleared 66 feet in width for  $13\frac{1}{2}$  miles. Stones, stumps, etc., removed from central 40 feet of the clearing. Wooden, stone and 9 corrugated iron culverts built in place. Grading and ditching completed for  $11\frac{1}{2}$  miles. Total length of road to the Kaministiquia River is about  $14\frac{1}{2}$  miles. The last mile of which should not be built until such time as the crossing point of the river has been decided upon, the road to be diverted to meet that.

Along the Dawson Road which was cut out as far back as 1870 the land is nearly all settled on and in places large clearings have been made. In other places, however, many poorly-cultivated farms are to be seen or land held by land speculators. In other places, owing to the rough and broken character of the country, only small clearings or garden patches are under cultivation. This class of land is to be found towards the Kaministiquia River. The land in many places is light, gravelly and stony. There are a good many Finlanders located along the road who appear to be making good progress, although on rough, broken land.

The same remarks will apply to the character of the land along the Dog Lake Road; good land in small patches here and there, but speaking generally, the country is rough and broken.

Along the John Street Road, Oliver Road and Arthur Street Road there are large areas of first class farming land under good cultivation. These lands have been settled on in places for many years.

Going south-west of Port Arthur in the Slate River Valley, you enter a fine farming country, under first class cultivation. Settlement as a whole will compare favorably with some of the best settlements in older Ontario. As you proceed south on the Pigeon River Road through the township of Blake and Crookes, the country becomes more broken and high mountains are passed, but in the valleys, however, the soil is first class, and after the completion of the road, it will all be occupied, as Fort William and Port Arthur offer splendid markets for all kinds of vegetables.

The same remarks will apply to the country on the Pearson and Scoble Roads.

## ROADS IN THE DISTRICT OF KENORA, IN THE VICINITY OF THE TOWNS OF KENORA AND KEEWATIN.

Number of miles of roads constructed or improved,  $23\frac{1}{2}$ .

(Of which 4 miles were macadamized and 15 graded, and the balance,  $4\frac{1}{2}$  miles, cut out.)

Amount expended during the season of 1913, \$95,533.58.

Operations on the Kenora and Keewatin roads began early in May at the east branch of the Winnipeg River on the old road between the town of Kenora and the village of Keewatin, which road passes through the village of Norman. At a point on this road about half a mile east of the village of Keewatin a trunk road was constructed running north west, crossing Darlington Bay of the Lake of the Woods over the bridge constructed by the Colonization Road Branch of the Public Works Department in 1912. The road continues north-westerly, passing the north end of Middle Lake in the Township of Pellatt, thence continues in a westerly direction across the fourth concession of said township, crossing the west boundary of Pellatt about a quarter of a mile north of the southwest angle of Lot 16, Concession 5. The road then continues westerly and north-westerly for a distance of about  $3\frac{3}{4}$  miles, passing along the east shore of Beulah Lake until it reaches the eastern end of Pelican Pouch Lake, where operations ceased; at a point about sixteen miles south-west of Malachi station on the Grand Trunk Pacific Railway and about the same distance east of the Manitoba boundary.

Besides this, a road was graded from Ignace Station to Osaquan Station on said railway, a distance of five miles. Beginning at Ignace, the first two miles of this road were through a muskeg, which had to be ditched and surfaced with cinders from the Canadian Pacific Railway round-house, to a depth of from eight to ten inches. Several culverts were put in and off-take ditches dug. The balance of the road was all cut out, stumped, and grading done where required. Several bad hills were cut down and graded, and 1,000 yards of corduroy laid, and covered with clay and gravel. Four small bridges were built of the following lengths, 100 feet, 6 feet, 15 feet and 40 feet. The traffic over this road is in connection with a stone quarry and a sawmill at Osaquan.

Besides the above road, one mile of road was cut out and fairly well graded at Minaki Station on the Grand Trunk Pacific Railway where it crosses the Winnipeg River, namely, Winnipeg Avenue and part of Front Street. Kenora Street and North Street. These roads connect Gun and Sandy Lakes with the Grand Trunk Pacific Railway Station. At the foot of Winnipeg Avenue on Sandy Lake, a dock eighty feet in length by sixteen feet in width was constructed.

Minaki is a town site laid out by the Department of Lands, Forests and Mines three years ago. Part of it has been disposed of, and it has now become a very prominent summer resort for the citizens of Winnipeg. Already the Grand Trunk Pacific Railway Company have commenced the construction of a large tourist hotel. Islands are numerous in the two lakes to the north and south of the railway, Sandy and Gun, and compare favorably with those of the Lake of the Woods.

The road as constructed between Kenora and Keewatin follows as closely as it was practicable to construct, the old road along the Canadian Pacific Railway, constructed nearly twenty years ago. The old road passed over a rough, broken and hilly country. From the east branch of the Winnipeg River west, very little work had been done on the road. No attempt had been made to cut down the grades or drain the low places. It was the most difficult and expensive piece of work I had

to construct this season, as rocky hills and steep pitches had to be cut down and the low places built up with rock. No gravel was available in the district and rock had to be crushed to surface the road with. The old road followed close to the bank of the Winnipeg River in places, or close to the right of way of the railway, where it was dangerous for teams to pass. Over 7,000 cubic yards of crushed rock was required on this road. The rock excavated from the hills was used in the road bed in the valleys.

The road between the two towns is now completed and will compare favorably with the best macadamized roads in any part of Northern Ontario. The distance from the east branch of the Winnipeg River on the Keewatin branch is 26-10 miles. At a point on this road about half a mile east of the Keewatin bridge, the trunk road branches to the north-west, crossing Darlington Bay on the long wooden bridge constructed last season by the Colonization Road Department. This bridge is over 600 ft. in length built on piles. From the Kenora and Keewatin Road to the bridge, a good portion of the road had to be built up with stone and surfaced with gravel, and crushed rock. North of the bridge through the Township of Pellatt the country was found very broken. The road winds through the valleys. In the rocky parts, road material, even soil was difficult to procure and had to be drawn a considerable distance. In other places, where the road passed through sections of good farming land, it was possible to use the grader. The road in places follows a Colonization Road cut out two years ago. This road was straightened and where practicable was changed in order to improve the grades. There is now a well graded road for a distance of nearly nine miles beyond the Darlington Bay bridge. There still remains  $5\frac{1}{2}$  miles of this road to be graded.

The country to the north and north-west of the towns of Kenora and Keewatin, through which the above road passes and extending west to the Manitoba boundary, and north to the Grand Trunk Pacific Railway, is generally rugged, hilly and rocky, and in part mountainous. Not more than one-fifth of it can ever be considered as fit for cultivation of any kind. The arable land occurs in small tracts varying from a few acres up to a hundred acres, but seldom exceeding a few thousand acres in extent; comprising nowhere any important or extensive field for colonization.

The country has at different times, in places, been swept by forest fires. There still remain, however, very considerable areas of Jack Pine, Spruce and Tamarac with scattering groves of Red and White Pine. Where the land is free from stone or rock, and except in the Jack Pine plains where the soil is very sandy and gravelly, the soil is a rich clay or clay loam; and vegetables, and all kinds of grain are being produced, and as there are good markets at the towns of Kenora and Keewatin, farming where carried on is very profitable. Heretofore the settler was seldom able to reach these markets except in the winter season when sleighing was good. With the road as now constructed, it will be possible for him to reach a market at all seasons of the year. Later on, this road, which is now within sixteen miles of the Grand Trunk Pacific Railway, might be extended, as all along the route, small scattered areas of fairly good land are met with. The road might also be extended west to the Manitoba boundary, a distance of about sixteen miles, if it is ever found practicable for the Manitoba Government to construct a trunk road east from Winnipeg north of the Canadian Pacific Railway to the Lake of the Woods, one of the finest tourist resorts in the west.



**DESCRIPTION OF TRUNK ROAD CONSTRUCTED BETWEEN TOWNS  
OF NORTH BAY AND MATTAWA, DISTRICT OF NIPISSING,  
DURING SEASON OF 1913.**

Number of miles of road constructed and graded .....	48
Number of corrugated iron culverts placed .....	36
Number of miles of road resurfaced with gravel .....	20
Amount expended .....	\$83,313.38

This road commences at the Town of North Bay where Kennedy Avenue intersects the boundary between the Townships of Widdifield and Ferris; thence southerly along Kennedy Avenue and the southerly production thereof, close to the shore of Lake Nipissing to line between Concessions 14 and 15 of the Township of Ferris; thence in an easterly direction across Concession 14 to near the Grand Trunk Railway; thence southerly along the west side of the Grand Trunk Railway to the Village of Callander in the Township of Himsworth, a distance of seven and one-half miles; thence easterly between the 8th and 9th Concessions to the Township of Himsworth and Ferris to the side line between Lots 9 and 10, Ferris; thence southerly across the 8th and 7th Concessions of the said last mentioned township, to the road between Concessions 6 and 7; thence easterly across Lots 9 to 5 inclusive, crossing Canadian Pacific Railway on Lot 5; thence southerly and south-easterly along the north shore of Nasbongsing Lake, north of the right of way of the Canadian Pacific Railway, passing through Nasbongsing Station, and entering the Township of Bonfield, and crossing to the south of the Canadian Pacific Railway at the outlet of Nasbongsing Lake into the Town of Bonfield; thence northerly through said town to the line between Concessions 8 and 9, township of Bonfield; thence continuing easterly along said Concession line across Lots 10 to 32, inclusive; thence southerly between Lots 32 and 33, across Concessions 8 and 7, Township of Bonfield; thence easterly between Concessions 6 and 7, across Lots 33, 34 and 35, to the townline between Bonfield and Calvin; thence southerly along said townline across Concessions 8, 7 and 6, Township of Calvin; thence east between Concessions 5 and 6, in the said last named township, across Lots 36 to 33 inclusive; thence southerly between Lots 33 and 32, across Concession 5; thence easterly between Concessions 4 and 5, across Lots 32 to 1, inclusive, to the Township of Papineau; thence easterly crossing the right of way of the Canadian Pacific Railway on Lot 33, Concession 13, near Calvin Station; thence continuing in a north-easterly direction across the 13th and 14th Concessions of the said Township of Papineau to the line between Concessions 14 and 15 on Lot 22, north of Earl's Lake; thence continuing easterly along the line between Concessions 14 and 15 across Lots 22 and 21, and still continuing in an easterly direction across the 14th Concession, to the side road between Lots 15 and 16, where the road passes close to the right of way of the Canadian Pacific Railway; thence continuing easterly along the north side of the said railway to Mattawa Station, on the said railway, a distance of forty-eight miles.

Construction work on this road was begun early in May, 1913, from both ends. Commenceing at Mattawa, the road followed the old travelled colonization road, built many years ago, first for lumbering purposes and later on improved in places by the Public Works Department for colonization purposes. This road passes through a portion of the Township of Papineau, in which there is little or no agricultural land. The country is almost one continuous bed, of boulders, small and large, with coarse gravel. The old road was in most places not more than 8 or 10 feet wide and in many places only the width of a waggon. I removed all the boulders from off the road for a width of from 18 to 22 feet and dug sufficient



ditches to carry off the surface water, and graded the road, cutting down all the bad hills and steep pitches and straightened the road from point to point. As good gravel was to be found in great quantities close to the road, the entire road was gravelled for a width of from 12 to 16 feet and to a depth of from 5 to 8 inches. Good stone culverts were placed wherever required.

As we entered the Township of Calvin on the east side fairly good agricultural land was met with, although stony in places. The country is all well settled and fair progress is being made. This road crosses the Pautois Creek on Lot 7 and the Amable du Fond River on Lot 21. There is a good concrete bridge across Pautois Creek but the bridge across the Amable du Fond River is a wooden one and has been in use for ten or more years and will shortly require to be removed. The covering is badly rotted and I re-planked it, and it will now last for a few years. The bridge is 120 feet in length. It is built on piers filled with rock. The piers are badly decayed and at present it would be unsafe to take heavy machinery over it. On Lot 26 a small bridge was constructed with two corrugated iron culverts 58 inches in diameter. The country along the road through the Township of Calvin is high and rolling. Large stone culverts were constructed where necessary and the road well graded and ditched. Several corrugated iron culverts were placed where stone could not be had conveniently. About three miles of the road was gravelled in places where it was most required. The road throughout this township is now in first class condition, from 18 to 22 feet in width. The low places were all built up with stone and the heavy grades cut down.

Entering the Township of Bonfield on the east, the land still continues good. The road crosses the Canadian Pacific Railway at the north-east angle of Lot 32, Concession 8, at the Village of Rutherglen to the north side, and again re-crosses to the south side on the same lot. On Lot 31 it crosses Spark's Creek where a concrete bridge was constructed by the Department of Public Works. Large corrugated iron culverts were used for the bridge on the creek crossing Lot 24, on the line between Concessions 8 and 9. Several small muskegs were crossed and these had to be filled in with stone and well drained. Numerous rocky hills were crossed and considerable rock cutting had to be done in order to make the grades passable. The country approaching Bonfield Station was exceptionally broken and required a great deal of work to make the road in good condition. On this part of the road corrugated iron culverts were placed on all the small streams. In the Town of Bonfield, across the Kabaskong River, a steel bridge with concrete abutments was constructed a year ago by the Public Works Department. The western approach to the bridge at the crossing of the Canadian Pacific Railway had not been filled in. Since October 31st I completed this part of the work, filling in over 1,500 cubic yards of rock.

After crossing the Kabaskong River, the road continues along the north side of the Canadian Pacific Railway, and at a distance of  $2\frac{1}{2}$  miles the Township of Ferris is entered, the road still continuing from a chain to a quarter of a mile from the right of way of the Canadian Pacific Railway, passing close to Nasbonsing Station on Lot 3, Concession 3, Ferris. The country still continues rocky and rolling although there is a fair percentage of fairly good agricultural land in places. The road crosses the Canadian Pacific Railway on the line between Concessions 6 and 7, on Lot 5, and follows the Concession road allowances and side road allowances throughout to the Village of Callander. From this crossing to Callander, forty stone and wooden culverts were constructed across the numerous small streams and runways. Throughout this entire township the country is

broken and rocky, although several first-class farms along the road were passed. Large numbers of boulders had to be drawn off the road and rocky ridges cut down. The road is now well graded and ditched although very little gravel was available, and later on it will be necessary to put gravel on the lower portions.

About three-quarters of a mile east of Callander the road crosses the Canadian Northern Railway and at Callander it crosses the Grand Trunk Railway to the west side and then continues northerly paralleling the railway until it reaches a point about a quarter of a mile south of Nipissing Junction, at the crossing of the Canadian Pacific Railway. Up to this point from Mattawa the road follows as nearly as possible the old road. It enters the Township of Himsworth half a mile east of Callander and continues across Concessions 27 and 28, Himsworth, when it again enters the Township of Ferris between Lots 31 and 32, and from that point it continues through the Township of Ferris until it crosses the boundary between Ferris and Widdifield on Lot 40, Concession 18. From near Nipissing Junction the new road was cut out, the old road being found almost impracticable owing to the rocky country passed through. The new road, as cut out, had no bad grades and passes through a country which has a fair percentage of agricultural land in it. It passes close to the shore of Lake Nipissing, passing close to a large number of summer resorts. From Nipissing Junction to North Bay the country is very level in places, the soil being light, sandy loam. No gravel was available and after the road had been well graded and ditched it was found necessary to crush rock so as to macadamize about four miles of it. This work was begun early in January when it was found cheapest to crush and haul rock. Between North Bay and Callander twenty first-class stone and wooden culverts were constructed and three wooden bridges.

This road was all constructed by day labor. The grader was used where it was found practicable but that covered only a very small portion of the entire road.

Eighty-three thousand three hundred and thirteen dollars and thirty-eight cents was expended on this road.

When the road between North Bay and Callander is stoned and the low places between Callander and Bonfield gravelled and a new bridge constructed across the Amable du Fond River, this road will be quite passable for automobiles or motor trucks. At present, the distance of forty-eight miles can be made in three hours.

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### ROADS IN THE DISTRICT OF SUDBURY.

Number of miles constructed and old roads improved, 72½.

(Of which 10 miles have been macadamized and 50 miles graded, 12½ miles cut out and partly graded.)

Amount expended, \$118,568.32.

Work on the Sudbury roads was commenced on or about the 1st of May, 1913, between the Town of Sudbury and the Murray mine which is distant 3½ miles west of Sudbury. A road had been constructed between these two points by the Colonization Road Branch some years ago. It passed through a very rocky and broken country, interspersed with several small muskegs which were difficult to drain. There was a good deal of traffic passing over this road between Murray mine and Sudbury, and also that of all the settlers in the Chelmsford Valley for twenty miles west, as far as Onaping on the west and north-west, Vermilion Lake on the south and Vermilion River on the north. It was therefore considered



necessary to construct a trunk road sufficient for the heavy traffic and farm produce that would be taken over it. The road was constructed as near as practicable to the stations along the Canadian Pacific Railway, through the Village at Murray mine, Azilda, as close to the Village of Chelmsford as possible, through the Village of Larchwood and west to Phelan.

Between Sudbury and a point a mile west of Murray Mine, the country is a series of rocky ridges and small muskegs. On the old road little had been done to modify the grades, and it was found necessary to do a great deal of rock cutting and filling in of the hollows in order to make a grade that was in keeping with the amount of traffic which would pass over the road. No gravel was available along the road.



The Sudbury and Murray Mine Stone Road.

A stone crusher was put to work along the road, also crushed rock was brought in by train from the Moose Mountain Mine, north of Sudbury. It required 5,000 tons of crushed rock to surface the road to a point about a mile beyond Murray Mine. Beyond this point the road passed through a section of country less broken, as far as Azilda Station on Lot 4, Concession 1, Township of Rayside, where the Chelmsford Valley, a large section of good agricultural country, is entered. The road then continues west and north-west within 5 to 15 chains of the right of way of the Canadian Pacific Railway to the line between Concessions 2 and 3, Lot 8, Rayside, thence west along said concession line across Lots 8, 9, 10 and 11, to the townline between the Townships of Rayside and Balfour; thence north 15 chains to the line between Concessions 2 and 3 of said Township of Balfour, thence west along the line between said Concessions to line between Lots 10 and 11, 5 miles; thence north and north-west crossing the Canadian Pacific Railway near the line between Lots 11 and 12; thence westerly

north of the right of way of said railway, crossing the Vermilion River and passing through the Village of Larchwood on the townline between the Townships of Balfour and Dowling; and still continuing westerly to the line between Concessions 3 and 4, Township of Dowling, thence west along said Concession line, across Lots 2, 3, and 4, thence south between Lots 4 and 5 to the Canadian Pacific Railway, in all a distance of 21 miles from Sudbury.

From Azilda west and north, the land is in most instances clay or clay loam, and in places sandy loam, fairly level, with that class of land extending for miles to the north and south of the road. A large portion of the country is cleared and under cultivation. All the good agricultural land has been settled upon, and fair sized clearings made. In many instances large clearings, with first-class buildings, are met with throughout this valley.



Sudbury and Murray Mine Stone Road passing under the Algoma Eastern Railway.

#### *Azilda Trunk Road:*

From a point on the Sudbury and Murray Mine Road half a mile east of Azilda Station, a road was constructed north into the Blezard Valley between Lots 2 and 3, Township of Rayside, across Concessions 1 to 5, inclusive, a distance of  $4\frac{3}{4}$  miles, to the line between Concessions 5 and 6, Township of Rayside; thence west between the said Concessions one mile, and east four miles to the line between Lots 7 and 8, Township of Blezard. This road was well ditched and graded. It passes through a first-class agricultural country; and gives to the settlers a good outlet to the markets at Murray Mine, Copper Cliff or Sudbury. It was intended to have extended this road further north for four miles to the Vermilion River, as the country still continues good and well settled. But owing to the lateness of the season, it was found impossible to continue the work.



From a point on the Sudbury and Murray Mine trunk road about one mile west of Murray Mine towards Larchwood on the trunk road, part of the road should be surfaced with stone or gravel. In places the soil is a heavy clay, and in the wet seasons it will be difficult for heavy traffic to pass over it. The road, however, has been well ditched and graded, the grades modified, the road widened and good substantial culverts constructed where required.

*Sudbury and Blezard Valley Trunk Road:*

From a point about two miles north of Sudbury, a trunk road was constructed northerly into the Blezard Valley, which is a continuation of the Chelmsford Valley above mentioned. The work began on the line between Lots 4 and 5. Concession



Sudbury, Murray Mines and Chelmsford Stone Road, between Sudbury and Murray Mines.

6, McKim, and continued northerly, passing the Stobie Mine, Mount Nickel Mine and Blezard Mine. For the first six miles, the road passes through a country which is broken in places, with rocky ridges which required a good deal of rock cutting and filling to improve the grades. Beyond that point, a fine agricultural country is entered. The road was completed for a distance of  $9\frac{1}{2}$  miles, terminating on the line between Concessions 1 and 2, between Lots 6 and 7. Township of Hanmer. Numerous culverts and small bridges had to be renewed on this road and deep drains constructed. The road is now in first class condition, but owing to the large amount of traffic which will pass over it from the settlement in the Valley, parts of it require to be surfaced with gravel or rock.

*Froud Mine Road:*

From a point on the Sudbury and Blezard Valley trunk road about two miles north of the Town of Sudbury, a road to the Froud Mine having a length of  $11\frac{1}{2}$

miles was constructed. This road passes through a rough, rocky section; the rocky hills had to be cut down and the valleys filled; it was also found necessary, owing to the great amount of traffic that passes over this road, to re-surface it with stone. Rock was crushed near the Froud Mine and placed on the road. It is now a first class macadam road, well drained.

#### *Garson Mine Trunk Road.*

Commencing at a point on the Sudbury and Brezard Valley Trunk Road, about two miles north of the town of Sudbury and extending to the Garson Mine in the township of Garson, through the townships of McKim, Neelon and Garson (distant  $8\frac{1}{2}$  miles)  $4\frac{1}{4}$  miles of old road were regraded and ditched, and  $\frac{1}{2}$  mile macadamized and  $4\frac{1}{4}$  miles of new road was graded and macadamized. The new road passes through a light sandy country, where it was found impassable



Bridge, 325 ft. long, over the Opickinimika River, Mile 13, West Shining Tree Road.

for heavy traffic without resurfacing with stone. Crushed rock was secured at the Moose Mountain Mine on the Canadian Northern Railway, and landed at the point on the road where it crosses the railway, at a cost of 75c. per ton; also rock from the waste dumps at the Garson Mine, where no charge was made. Over 5,000 tons of rock was used on this road. The balance of the road was high, and is now well graded and ditched. Several small bridges were constructed and corrugated iron culverts were placed on the small streams, the westerly five miles of this road passes through a fairly good agricultural country, the latter portion through a light sandy section.

#### *West Shining Tree Mining Road.*

Commencing at a point on the Canadian Northern Railway at mileage  $78\frac{1}{2}$  north of the town of Sudbury, on the east shore of Duchabanning Lake, thence northerly, passing the north end of Deschenes Lake, and north-easterly through

townships of Garvey, Garibaldi, part of Miramichi and Asquith, to the south-east end of West Shining Tree Lake,, a distance of nineteen miles. This road was cut out 40 feet in width through a virgin forest of jack pine, spruce, white birch and poplar, and a few scattering groves of red and white pine. The road crosses the Opickinimika River about thirteen miles north-east of the railway. The road to this point has been nearly all well graded and cross-layed in places, several culverts have been built, and at the Opickinimika River a first class wooden bridge has been constructed, 325 feet long, built on piers filled with rock. A bridge was also built across the Papoose Creek, about a mile east of Opickinimika, having a length of 196 feet, also one across Temple Creek 50 feet long. This work was done since the 31st October. East of the river the road has been well cut out and well graded and is a first class winter road and suitable for light summer traffic.

The road passes through a country generally rolling with sand or gravel ridges, along which the road followed. Several of the sand ridges had to be cut down but little or no rock was met with on the road. There are very few heavy grades and this road is now in the condition for traffic. The road is almost completed to the gold mines now being operated.

From the end of the road at Shining Tree Lake there is a winter road cut out by the miners so as to enable them to take in supplies during the winter season. This road, however, is not fit for summer traffic.

This road, besides serving the requirements of the mining community, will be a useful road later on when timber operations are being carried on in this district in the future, as it opens up a section of the country in which there was no communication by way of roads.

#### SAULT STE. MARIE AND SUDBURY TRUNK ROAD.

Total Expenditure .....	\$76,275 40
Total number of miles graded .....	35
of which 10 miles has been macadamized, and $\frac{3}{4}$ of a mile surfaced with rocmac, and 13 miles surfaced with gravel.	

This road commences at the eastern limit of the town of Sault Ste. Marie and runs in an easterly and southerly direction to Echo Bay (Ekoba), a distance of fifteen miles; thence easterly a further distance of ten miles, to the village of McLennan, thence continuing easterly a further distance of  $5\frac{1}{2}$  miles to the village of Desbarats, thence easterly two miles to Portlock, thence easterly six miles to Bruce Mines, thence easterly nine miles to Thessalon; thence easterly to Blind River, distant eighty-three miles from Sault Ste. Marie.

Of the distance between these two points, thirty-five miles of road was ditched and graded, of which ten miles has been macadamized and  $\frac{3}{4}$  of a mile surfaced with rocmac and thirteen miles surfaced with gravel.

This road, after leaving the town of Sault Ste. Marie, passes through the Garden River Indian Reserve, the townships of Tarbutt and Tarbutt Additional, Johnson, Plummer and Plummer Additional, Lefroy, Thessalon, Bright and Bright Additional, Thompson and part of Cobden, past the villages of Garden River, Echo Bay, Bar River, Desbarats, Portlock, Bruce Mines, Thessalon and Blind River. It follows in most instances the old colonization roads constructed at different times. The road is well selected where it would serve the greatest number of people, taking into consideration the character of the country to be passed through. It passes





Loading Crushed Rock at Echo Bay for the Sudbury and Sault Ste. Marie Trunk Road.



through a country in which there is a fair percentage of good agricultural land, under cultivation. In places the country is broken and rocky. Tributary to this road on the north are to be found areas of good land well cultivated. Large clearings and fine buildings are to be met with everywhere.

Owing to the unsatisfactory condition of the roads heretofore, it has been difficult and at periods almost impossible for the settlers to reach good markets at Sault Ste. Marie or other smaller towns along the railway. The road as now constructed will allow the settlers as far as Blind River, about eighty miles east of Sault Ste. Marie, to reach that point. It will also give them access to all the stations along the Canadian Pacific Railway.

Part of the road only has been surfaced with gravel or stone and it will take another season to finish the road to Blind River. Several culverts and small bridges are required to be built. The work as performed this season covered the worst parts of the road, thirty-five miles out of the eighty. The following is a general description of the work done:—

Commencing at the eastern limit of the town of Sault Ste. Marie and running east, the road was well graded and ditched for eleven miles. The first  $\frac{3}{4}$  of a mile, after being macadamized, was surfaced with rocmac 12 feet wide. The next  $\frac{3}{4}$  of a mile was covered with three course macadam 12 feet wide. This mile and a half of the road had a very bad sub-grade and it was necessary to make the stone from ten to twelve inches deep, consolidated. The balance of this section up to mileage  $5\frac{1}{2}$  was covered with two course stone.

Section two extended from Garden River to Echo Bay. The work done in this connection consisted of raising, widening, riprapping and railing Echo Bay fill, the North Channel fill and the Root River fill. Gravel put down on this road during the winter of 1912 was found insufficient. It was raked and rolled and the whole section regraded and widened and resurfaced with one course of limestone. A gap is thus left unsurfaced of nearly a mile between Root River at mileage  $5\frac{1}{2}$  and mileage  $6\frac{1}{2}$ . Eight miles of road were under construction.

Section No. 3.—The work done in this section consisted of grading and draining between mileage 15, Echo Bay, and mileage  $20\frac{1}{2}$ , a large amount of riprapping was necessary as a considerable portion of this section of the road had been badly washed out, the ditches having been deepened and widened by freshets so that it was dangerous for teams to pass owing to the narrow road bed. A new right-of-way was required for a distance of  $\frac{3}{4}$  of a mile. This was purchased from the adjoining land owners and a new road constructed. This section was also gravelled with the exception of  $2\frac{3}{4}$  miles, which was left to be gravelled during the winter season on account of the long haul. This work has been completed since the close of the fiscal year. Ten Corrugated Iron Culverts were placed in this section.

Section No. 4.—This camp built and graded the section between Nestorville, Mile  $44\frac{1}{4}$  and Mile  $49\frac{3}{4}$ , a distance of five and a half miles. Gravel was also placed between mile  $44\frac{1}{4}$  and mile 48; the remainder being left unsurfaced on account of there being no material available without too long a summer haul. This work followed in the main an already existing road, which, however, was little more than a trail. The construction was practically new. On this section twenty-one metal culverts were placed.

Section No. 5.—This camp built, graded, drained and gravelled three miles of a road immediately east of Portlock, between mile  $34\frac{1}{2}$  and mile  $37\frac{1}{2}$ . As in Section 4 this road was already in existence as a mere trail. A considerable amount

of rock work was necessary as there were a number of abrupt rocky ridges. This work comprised the westerly half of the Portlock—Bruce Mines Section; the remainder being in quite good condition and requiring only permanent culverts, some of which are in place ready to be installed in the spring. The number of metal culverts placed in this section was eighteen. It was intended also that this camp should put in permanent culverts between Desbarats and McLennan, which road was, with this exception, in fairly good condition. There was not time to do this on account of the lateness of the season and the culverts are stored at the village of Desbarats, to be installed during the coming season.

Section No. 6.—This camp built  $4\frac{1}{2}$  miles of road along the Mississaga River west of the town of Blind River, from mile  $78\frac{1}{4}$  to mile 83. The work followed the lines of an existing road in the main, but is practically new construction throughout. For almost the entire distance the right-of-way had to be cleared and straightened. In several places as well a considerable amount of filling had to be done as the previous road was impassable for several weeks during the year, at high water of the Mis-issaga River. On this stretch of road twenty-one metal culverts were placed.

Besides the above mentioned roads, the following works were constructed:

A reinforced concrete culvert 6 x 6, one and one half miles east of Portlock and two reinforced concrete bridges near Portlock, one 16 ft. and the other 30 ft. span. A reinforced concrete bridge over Anderson Creek, between McLennan and Desbarats was also built and the road straightened at this point. This involved diverting Anderson Creek and a considerable fill, stone being for the base.

Culverts used in this work were for the most part corrugated iron pipe, finished where necessary with concrete ends. The road between Sault Ste. Marie and Thessalon is now in first class condition with the exception of about  $\frac{7}{8}$  of a mile east of Root River, which requires to be resurfaced with stone.

## PART OF THE DISTRICT OF ALGOMA, ROADS IN THE VICINITY OF THE TOWN OF HEARST.

Amount Expended .....	\$18,529 61
Number of miles of bush line cut out .....	29
Number of miles of road graded or partially graded .....	7

### DESCRIPTION OF ROADS CONSTRUCTED.

#### *Road No. 1.—Townships of Way and Hanlan:*

Situate along the north side of the right-of-way of the National Transcontinental Railway.

Commencing at the east boundary of the township of Way, near the junction of the Algoma Central and Hudson Bay Railway, and extending westerly along the north side of the National Transcontinental Railway a distance of  $5\frac{1}{2}$  miles to the side road between Lots 18 and 19, township of Hanlan. This road was cut out the full 66 feet; 2.2 miles of the road was well grubbed and the timber burned. One mile of cross-lay was laid and well ditched and graded. The balance of the road, 3.3 miles is still to be burned and grubbed.

*Road No. 2.—Township of Kendall and Way:*

Situate between townships of Kendall and Way across Concessions 7, 8, 9, 10, 11 and 12 and part of Concession 1, township of Casgrain, 4.3 miles. Road cut the full width and grubbed 52 ft. and burned, with the exception of about one quarter of a mile on Concession 7 on the Transcontinental Railway, south to the Mattawashquia River about half a mile, the road has been well ditched and graded.

*Road No. 3.—Township of Kendall:*

Situate between Lots 24 and 25 across Concessions 11 and 12,  $1\frac{1}{2}$  miles. The road was cut, grubbed, and burnt ready for grading with the exception of a few chains on Concession 12.

*Road No. 4.—Township of Kendall:*

Situate between Lots 12 and 13 across Concessions 7, 8, 9, 10 and part of 11, 3 1-3 miles. The road was cut, grubbed and burnt ready for grading.

*Road No. 5.—Front St. Extension, Townships of Kendall and Way:*

Front St., in the Town of Hearst, was produced westerly along the southerly limit of the Transcontinental Railway Company's station grounds to the Algoma Central Railway right-of-way  $1\frac{1}{4}$  miles. The road was cut out and burned in 1912. In 1913 it was well ditched and graded.

*Road No. 6.—Township of Kendall:*

Situate between Concessions 10 and 11, across Lots 22, 23 and 24,  $\frac{3}{4}$  of a mile. The road was cut out, grubbed and burnt, ready for grading.

*Road No. 7.—Township of Kendall:*

North Boundary of Kendall, through Lots 13 to 29, both inclusive, 5.2 miles. The road was cut out, well grubbed and burning completed with the exception of Lots 18 to 27.

*Road No. 8:*

Trunk road along Transcontinental Railway, north side, from the east end of the Transcontinental Railway Company's station grounds at Hearst east to the east boundary of the township of Kendall, eight miles. The road was cut out the usual width, 66 ft. The west  $2\frac{6}{10}$  miles has been grubbed and burned off and the balance has been burnt over but not grubbed.

Besides the above roads, part of 9th Street and part of 10th Street in the town plot of Hearst were stumped and graded about half a mile. Part of Front Street about half a mile was graded.

It was found when cutting out and grading the roads in the vicinity of Hearst that little or no difficulty was met with in getting sufficient drainage, although in places the ground was level and inclined to be semi-muskeg. In the higher land the soil is first class clay loam. No sand or gravel was met with. The roads as cut out will allow settlers who have taken up lands in the town-



ships adjacent to the town plot an opportunity of reaching the station. All roads cut out will make first class winter roads. The road between the town of Hearst and the Algoma Central Railway is in good condition for both summer and winter traffic.

It was found necessary to construct a small office and storehouse combined for the storing of supplies and machinery. The building was constructed on the Lots 142 to 149 on George Street, west of 11th Street, owned by the Department. The lots were well stumped as a protection against fire, before the building was erected.

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### GENERAL DESCRIPTION OF ROADS CONSTRUCTED AND IMPROVED IN 1913 IN THE DISTRICT OF TEMISKAMING, ALONG THE LINE OF THE GRAND TRUNK PACIFIC AND THE TEMISKAMING AND NORTHERN ONTARIO RAILWAYS.

(All roads cut out the full width 66 feet and the centre 32 feet grubbed ready for grading and ditching.)

Total number of miles of road under construction.....	190
Number of miles of bush road cut out.....	138
Amount expended .....	\$230,704.37

#### *Road No. 1.—Township of Bradburn:*

Situate along the north boundary of the above township on the Grand Trunk Pacific Railway, commencing at Lot 7 and extending west across part of Lot 7 and all of Lots 8, 9, 10, 11 and 12, 1.75 miles. Road cut 66 feet wide, the centre 32 feet well grubbed and all the timber and brush burned off.

#### *Road No. 2.—Township of Bradburn:*

Situate between Lots 12 and 13, across Concessions 7, 8, 9, 10, 11 and 12, 4.7 miles. Road was cut and grubbed and burning completed with the exception of 75 chains on Concession 8.

#### *Road No. 3.—Township of Bradburn:*

Situate between Concessions 6 and 7, across Lots 1 to 22 to the Mattagami River, 6.73 miles. Road cut and grubbed but not burnt.

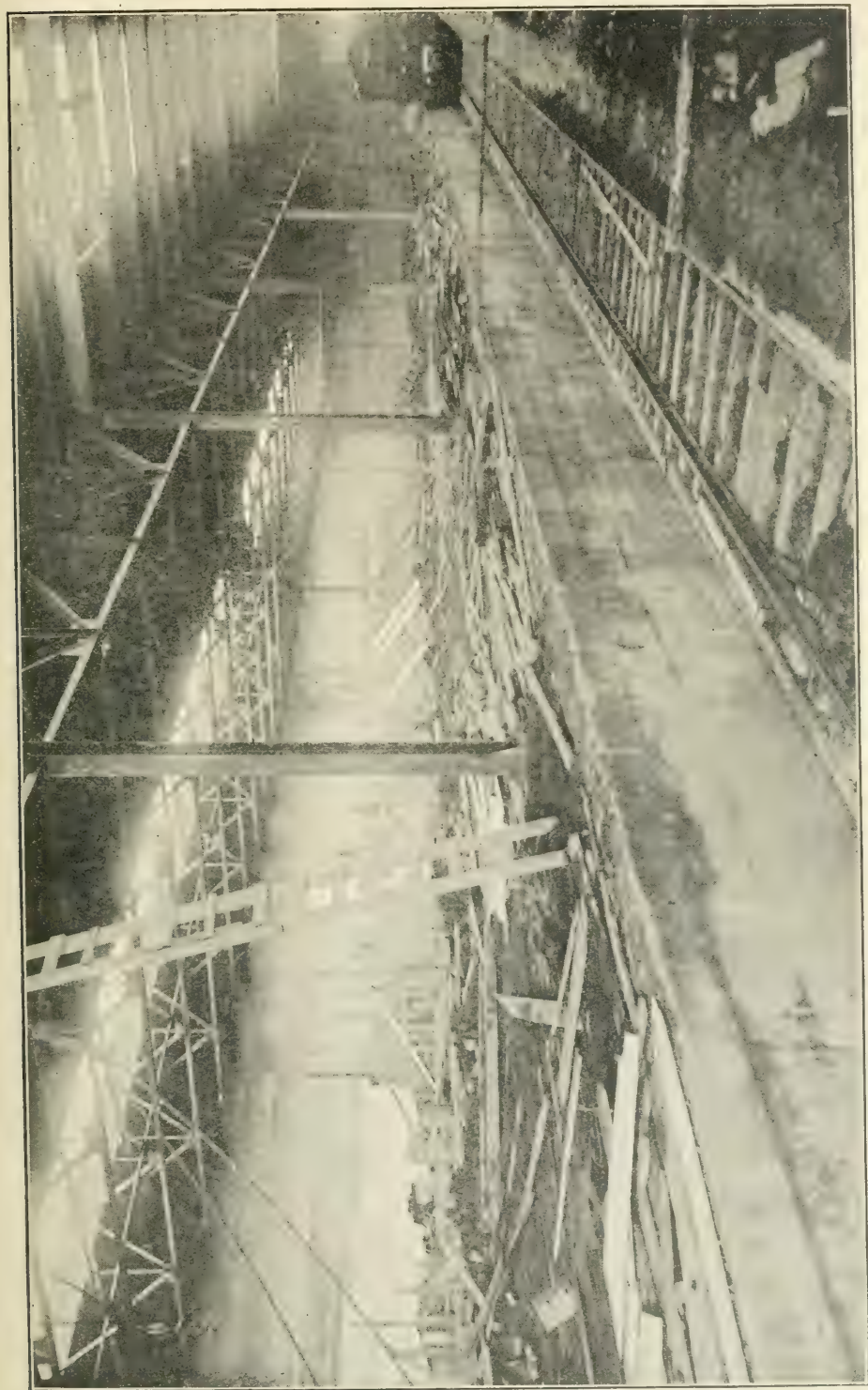
#### *Road No. 4.—Township of Calder:*

Situate along west boundary across Concessions 1 to 12 inclusive, 9 miles. Eight miles of the road has been cut and grubbed. The burning has yet to be done for over 6½ miles.

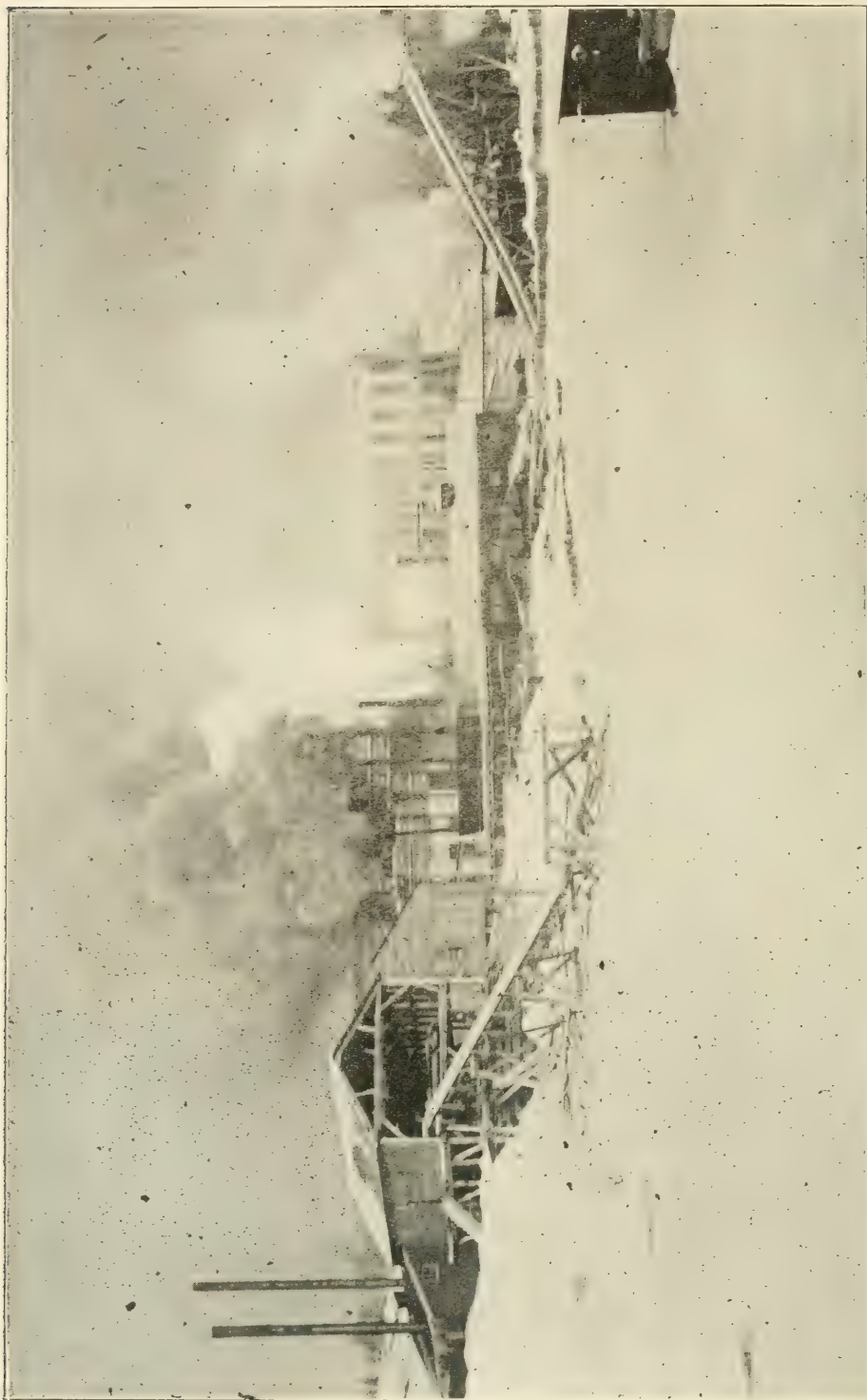
#### *Road No. 5.—Township of Calder:*

Situate along the north boundary across part of Lot 4 and all of Lots 5 to 28, both inclusive, 7.76 miles. Road cut and burned off.





Interior of the Abitibi Pulp & Paper Company's Mills, Iroquois Falls, Abitibi River, District of Temiskaming.



Saw Mill, Wood Room and Contracting Plant of the Abitibi Pulp & Paper Company at Iroquois Falls, Abitibi River.

*Road No. 6.—Township of Colquhoun:*

Situate between Concessions 6 and 7, across Lots 13 to 28, both inclusive, 5.06 miles. Road cut, grubbed and burned with the exception of part of Lots 18, 19, 20 and 21.

*Road No. 7.—Township of Colquhoun:*

Situate between Lots 12 and 13 across Concessions 1 to 6, both inclusive,  $4\frac{1}{2}$  miles. Road cut, grubbed and all timber and brush burned off.



Trunk Road north of Cochrane, between Lots 18 and 19, Glackmeyer.

*Road No. 8.—Township of Calder:*

Situate between Lots 12 and 13 across Concessions 1 to 12, both inclusive. This road was cut last season (1912), but owing to the wet season it was impossible to complete the burning or grubbing. The burning was completed this season (1913) but there is yet some grubbing to be done on Concessions 3 and 4. This season 3.11 miles were well ditched and graded between Concessions 4 and 10.

*Road No. 9.—Township of Calder:*

Situate between Concessions 6 and 7 across Lots 1 to 28, both inclusive. This road was cut out last season (1912) across Lots 1 to 28, but the burning or grubbing was not all done. This season the burning was completed. Across part Lots 13, 14, 15, 16, 17, 24 and 25 the road was well ditched and graded.



*Road No. 10.—Township of Clute:*

Situate along the west boundary across Concessions 1 to 10. Last season (1912) this road was cut, but owing to the wet season the grubbing and burning was not completed. This season the burning and the grubbing was completed and also the road cut across part of Concession 2 and all of Concession 1, 1.43 miles, grubbed and all brush and timber burned off. All the culverts required were constructed across Concessions 1 to 6, both inclusive, and the bridge over Deception Creek on Concession 5 was rebuilt. The old bridge was carried away by the spring freshet 1913. The road was then ditched and graded across Concessions 1 to 6. Concessions 7, 8 and 9 are now ready for ditching and grading.



A Typical View of the Clay Lands in the Abitibi Valley, looking east across the Townships of Brower and Fox.

*Road No. 11.—Township of Clute:*

Situate along the south boundary across Lots 1 to 19 both inclusive, and Lots 23 to 28 both inclusive, 7.78 miles. This road, with the exception of Lots 23 to 28 both inclusive, was cut last season (1912) but not all burned or grubbed. This year, last season's work was all burned over, and the road well grubbed across Lots 1 to Frederick House River.  $1\frac{1}{2}$  miles of corduroy was laid across part Lots 1 to 7 and a bridge built over creek on Lot 6; 1.77 miles across parts of Lots 1 to 6 were well ditched and graded. The balance of the road to the Frederick House River is ready for ditching. This year the road was also cut across Lots 23 to 28 both inclusive, well grubbed and all brush and timber burned off. Lots 28, to the west side of the Buskego River, were then well ditched and graded.



*Road No. 12.—Township of Clute:*

Situate between Concessions 2 and 3 across Lots 1 to 7, to the Grand Trunk Pacific Railway, 2.24 miles. This road was cut out this season, partly grubbed and burned over once. It still requires to be graded and two small bridges built. It was cut to serve as a winter road.

*Road No. 13.—Township of Clute:*

Situate between Concessions 6 and 7 across Lots 1 to 28 both inclusive, nine miles. This road was all cut out last season (1912), but was not all burned or grubbed. Across Lots 1 to Frederick House River was partly graded last season (1912). This season, however, it was found necessary to deepen the ditch 2.68



On the Town Line between Glackmeyer and Lamarche, east of Cochrane, showing how Clay Roads are rutted during the wet season.

miles from the Frederick House River, west across Lots 10 to 28 was all burned off, and the road well ditched and graded from the river west across Lots 10 to 26 inclusive. Lots 27 and 28 have yet to be ditched and one small bridge to be constructed on Lot 27.

*Road No. 14.—Township of Clute:*

Situate between Concessions 8 and 9 across Lots 1 to 5 and part of 6 and across Lot 28, a distance of 1.95 miles. This road was cut this year, well grubbed and the burning completed across Lots 1 to 3. No grading done.

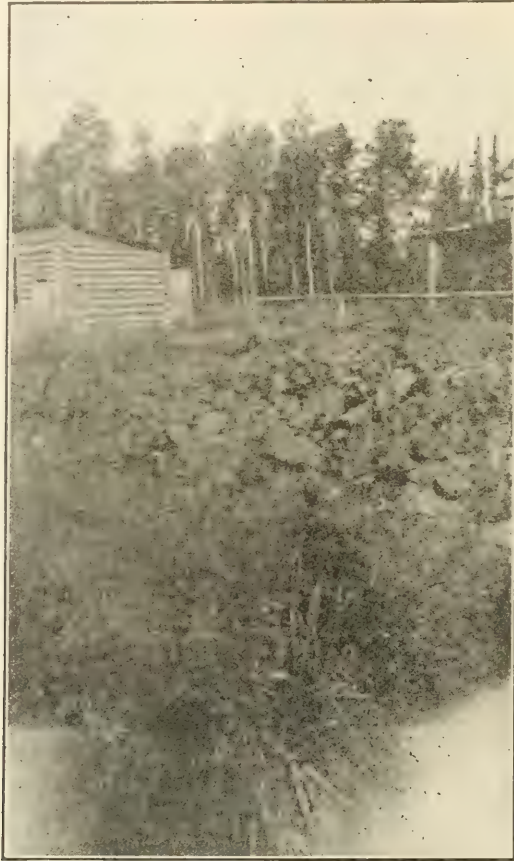
*Road No. 15.—Township of Clute:*

Situate between Lots 18 and 19, across Concessions 1 to 12, both inclusive, nine miles. This road was all cut last season (1912), but was not all grubbed or

burned. This year it was burned across Concessions 1 to 4 to the Grand Trunk Pacific Railway and across Concessions 7 to 10, in all 5.50 miles. Concession 7 was well grubbed but not graded.

*Road No. 16.—Township of Clute:*

Situate between Lots 12 and 13 across Concessions 1 to 8, six miles. Across Concessions 1, 2 and part of 3 to the Grand Trunk Pacific Railway, 1.93 miles was cut out this season but was not grubbed. This latter section was also burned off. From the Grand Trunk Pacific Railway north across part of Concession 4



Mr. Frank Moberly's Cabbage Garden, north of Abitibi Lake, near the Quebec Boundary.

and all of Concessions 5 and 6 the road had been partly built three years ago by the Colonization Road Branch. This season it was all gone over, re-ditched and several new culverts put in. A new bridge 100 ft. long was built in place of a temporary one across the Buskego River, the old one having been carried away by the spring freshets. From the Buskego River north across part of Concession 6 the road was well ditched and across Concessions 7 and 8 well grubbed ready for ditching.

*Road No. 17.—Township of Leitch:*

Situate between Concessions 6 and 7 across Lots 1 to 6, 2.07 miles. This road was cut this year, grubbed and burning completed except a few chains on Lots 5 and 6. No grading was done. Three small bridges will be required to be built.

*Road No. 18.—Township of Leitch:*

Situate along the south boundary across Lots 1 to 10 to the Frederick House River, 2.91 miles. This road was cut last season (1912), but the grubbing and burning was not completed. This year Lots 1, 2, 3 and part of Lot 4, in all 1.12 miles, were burned over. Across part of Lot 1, 22.10 chains were graded.



Another view of Mr. Frank Moberly's Farm.

*Road No. 19.—Township of Blount:*

Situate along the west boundary across Concessions 1 to 10, 7.50 miles. Across Concessions 1 to 4, three miles, the road was cut last season (1912) but was not all burned. This season Concessions 1 to 4 were burned off, and the road cut, grubbed and burned across Concessions 5 and 6, 1.50 miles. Concessions 7 to 10 were cut, but only partly grubbed and burned. The road across Concessions 1 to 6 was well ditched and graded for 4.50 miles.



*Road No. 20.—Township of Blount:*

Situate along the south boundary from the west side of Lake Dora west across 15 to 28, 4.54 miles. This road was all cut last season (1912) but the burning and grubbing had not been completed. This season the road was all graded and a bridge built over Lillabelle Creek, Lot 25.

*Road No. 21.—Township of Blount:*

Situate between Concessions 6 and 7 across part of Lot 28, 10 chains. This road was cut this season but not burned or grubbed.



A Road through a Spruce Swamp, east of Cochrane Clay Belt.

*Road No. 22.—Township of Blount:*

Situate between Lots 18 and 19, across Concession 1 and part of Concession 2 to the Abitibi River, 1.30 miles. This road was cut last season (1912) and this season the road was all graded.

*Road No. 23.—Township of Glackmeyer:*

Situate along the west boundary for nine miles. This road was cut last season (1912) and partly graded, but owing to the wet weather was not all burned off. This year the remainder of the road has all been burned off. From the Grand Trunk Pacific Railway north across part of Concession 2 and all of Concessions 3 to 6 the grade was widened from 24 to 30 feet and ditches deepened throughout. A new bridge was built across creek on Concession 7 and several new culverts put in.

*Road No. 24.—Township of Glackmeyer:*

Situate between Lots 24 and 25 across Concessions 2, 3, and 4, 2.25 miles. This road was partly built three years ago and was in need of repair. This season Concession 2 was all reditched and graded for a distance of 60 chains.

*Road No. 25.—Township of Glackmeyer:*

Situate between Lots 18 and 19 across Concessions 1 to 12, both inclusive, nine miles. This road was built four years ago and was in need of repair. This season 30 chains across Concession 2 were regraded. A large sand hill on Concession 4 cut down and corduroy relaid on Concession 5, the old corduroy having



A Settler's Home on the Trunk Road six miles east of Cochrane, overlooking the Valley of the Abitibi, North Boundary of Brower.

been burned during the dry spell in July, 1913. Clay was then drawn and spread over this corduroy. Across Concessions 6 to 12 the road bed was widened from 24 to 30 ft. and the whole road across Concessions 1 to 12, both inclusive, regraded. Across Concessions 7 to 12 required burning. This was partly done this season.

*Road No. 26.—Township of Glackmeyer:*

Situate between lots 12 and 13 across Concessions 1 to 6, 4.50 miles. This road was cut last season (1912) but was not burned. Last winter two pile bridges, 75 and 100 ft. in length, were built on Brule or Brower Creek crossing this road, one on Concession 2 the other on Concession 6. This latter bridge was damaged by high water this spring and was repaired. This season the road was all burned off and well grubbed. All the culverts necessary were then put in and the road was all ditched and graded.

*Road No. 27.—Township of Glackmeyer:*

Situate along the south boundary 7.43 miles to the Abitibi River. This road was cut last season (1912) and partly graded, but little or no burning had been done. Last winter a pile bridge 50 ft. long was built over Brule Creek on Lot 11. This season the road was all burned off. The grubbing was done and 5,300 feet of corduroy laid across part of Lots 14 to 17. The whole road was then ditched and graded. During the dry weather in July ten chains of corduroy were burned across Lot 23. In place of relaying the corduroy, clay was drawn and used for grading.

*Road No. 28.—Township of Glackmeyer:*

Situate between Concessions 1 and 2, across Lots 19, 20, 21 and part of Lot 22, to intersect 9th Ave., Town of Cochrane, a distance of 1.12 miles. This road was cut out, well graded and ditched.



Headquarters of the Northern Development Branch at Ground Hog River, Transcontinental Railway. Showing Vegetable Garden.

*Road No. 29.—Township of Glackmeyer:*

Situate between Concessions 2 and 3 across Lots 1 to 28, both inclusive, nine miles. Part of this road across Lots 7 to 21, inclusive, had been cut, and across Lots 14 to 28 both inclusive, partly graded, by the Colonization Road Branch two years ago. This season the road was cut, grubbed and burned off across Lots 1 to 6, 1.88 miles, and across Lots 25 to 28, a distance of 1.32 miles. Lots 7 to 13, both inclusive, were grubbed. Lots 4 to 13 were ditched and graded. The bridge over Brule Creek, damaged by high water, was repaired. Lots 14 to 15 were ditched. Lots 19 to 21, both inclusive, were grubbed, and Lots 22 to 28, both inclusive, cut out, grubbed and all timber burned off. Bridges were built on Lot 21 and 22, and 60 chains of corduroy laid on Lots 25 to 27. From Lots 19 to 28, both inclusive, the road was then ditched and graded. Across Lot 7, ten chains of cross-lay were laid.

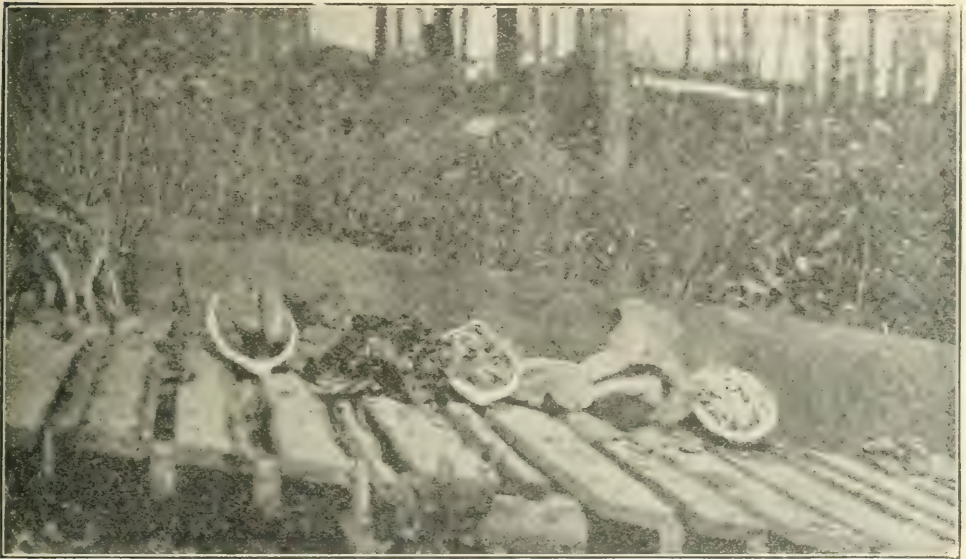


*Road No. 30.—Township of Glackmeyer:*

Situate between Concessions 4 and 5, from Abitibi River, west across to Lot 21 to the east side of Lillabelle Lake, 6.05 miles. Part of this road was cut four years ago from Lot 15 to Lillabelle Lake. This season the cutting was continued to the Abitibi River across Lots 14 to 2, 3.87 miles, grubbed and brush and timber burned off. The road was also well ditched and graded across Lots 6 to 18 and a bridge built over creek on Lot 11, and 70 chains of small corduroy laid across part Lots 9 to 11.

*Road No. 31.—Township of Glackmeyer:*

Situate between Concessions 6 and 7 from the Abitibi River, east of Lot 4, west across Lots 4 to 28 inclusive, eight miles. This road was all cut last season (1912) but was not all burned or grubbed. This season the road was all graded and burned off. The bridges on Lots 11, 12 and 23 had to be repaired, having been damaged by spring floods.



Vegetables at the Ground Hog River, old Headquarters of Fauquier Bros., Railway Contractors, Transcontinental Railway, July 15th.

*Road No. 32.—Township of Glackmeyer:*

Situate between Concessions 8 and 9 across Lots 19 to 28, 3.23 miles. Road cut, well grubbed and all brush and timber burned off.

*Road No. 33.—Township of Glackmeyer:*

Situate between Concessions 10 and 11 across Lots 13 to 19, both inclusive, 2.21 miles. This road was completed this season, with the exception of two culverts on Lot 13 and some burning on Lots 13, 14, and 15.

*Road No. 34, Township of Kennedy:*

Situate along the west boundary from the Abitibi River north across part of Concession 3 and all of 4 and 5 and part of 6, 1.70 miles. This road was cut this season, grubbed and the burning partly done.

*Road No. 35.—Township of Kennedy:*

Situate between Lots 23 and 25 across Concessions 1 to 4, three miles. This road was cut last season (1912) but was not burned. This season it was all burned off.

*Road No. 36.—Township of Kennedy:*

Situate between Lots 12 and 13 across Concessions 1 to 8, both inclusive, six miles. This road was cut this season, well grubbed and the burning completed with the exception of Concessions 7 and 8.

*Road No. 37.—Township of Kennedy:*

Situate along the south boundary across Lots 13 to 28, both inclusive, 3.80 miles. Part of this road was cut out last season (1912), but no burning or grading



Saw Mill and Rossing Plant of the New Ontario Colonization Co. on the Mattagami River, Township of Kendrey.

was done with the exception of Lot 28 and part of Lot 27 west of the Abitibi River, a distance of 44.05 chains. This piece was partly graded in 1912 and repaired this season. The burning east of the Abitibi River from Lots 13 to 26 inclusive, 3.56 miles, was done this season. The road across part of Lot 15 and all of Lots 14 and 13, 54.83 chains, was cut, and all timber and brush burned off. From the junction of the road, between Lots 2 and 3, township of Brower, to the west bank of the Abitibi River, 1.05 miles was well ditched and graded and the hill on east bank of river cut down.

*Road No. 38.—Township of Kennedy:*

Situate between Concessions 4 and 5, across Lots 25 to 28, 1.14 miles. This road was cut, grubbed and the burning completed, with the exception of Lot 27.

*Road No. 39.—Township of Kennedy:*

Situate between Concessions 6 and 7, across Lots 1 to 16, both inclusive, five miles. This road was cut, well grubbed and most of the burning completed.

*Road No. 40.—Township of Lamarche:*

Situate between Lots 8 and 9, across Concessions 1 to 6, six miles. Part of this road was built last season (1912). All of Concession 6 was ditched and part of Concession 4, and the road cut south across half of Concession 2, but little or no burning had been done. This season the burning was completed over last year's work (1912). A pile bridge, single span, was built over creek on Concession 4.



View of the Macadamized Road east of Sault Ste Marie, on the Sudbury and Sault Ste. Marie Trunk Road.

The cutting was extended this season across Concession 1 and half of Concession 2,  $1\frac{1}{2}$  miles. This road was cut, grubbed and the burning almost completed. The road is now ditched and graded across Concessions 3 to 6, and 20 chains across Concession 2.

*Road No. 41.—Township of Lamarche:*

Situate between Lots 6 and 7, across Concessions 2 to 5, and part of 1,  $4\frac{3}{4}$  miles. This road was cut, grubbed and the burning nearly all completed. The road has been well ditched and graded across Concessions 3 to 5.

*Road No. 42.—Township of Lamarche:*

Situate between Concessions 1 and 2, across Lots 1 to 4 inclusive, and part of 5 to the east side of lake,  $2\frac{1}{4}$  miles. This road was cut, the first mile through a very heavy windfall, grubbed, but not burned.



*Road No. 43.—Township of Lamarche:*

Situate between Concessions 3 and 4, across Lots 1 to 6, 3 miles. Across Lot 1 and Part of Lot 2, in all 66 chains, the road was well ditched and graded. The balance of this road is cut out, grubbed, but the burning is not all done. From where the road crosses the Temiskaming and Northern Ontario Railway a road 30 ft. wide, well grubbed, was cut on each side of the track south to the railway station, a distance of 10 chains.

*Road No. 44.—Township of Lamarche:*

Situate between Concessions 5 and 6, across Lots 7 and 8, in all one mile. This road was cut out and graded.



Sudbury and Sault Ste. Marie Trunk Road Crossing Root River, close to the Canadian Pacific Railway.

*Road No. 45.—Township of Brower:*

Situate along the west boundary from the Temiskaming & Northern Ontario Railway, north across Concessions 2 to 6, in all  $4\frac{3}{4}$  miles. This road was cut last season (1912) but was not burned. This season it was all burned off and graded. A pile bridge was built over Brule Creek, Concession 6.

*Road No. 46.—Township of Brower:*

Situate between Lots 2 and 3, across Concessions 3 to 6, four miles. This road was cut and partly graded last season (1912). This season the road has been completed and a bridge built on Concession 6.

*Road No. 47.—Township of Brower:*

Situate along the south boundary, in all  $5\frac{1}{2}$  miles. This road was cut last season (1912) but was not burned off. This year part of Lot 12 and all of Lots 2 to 8 were burned, in all  $3\frac{3}{4}$  miles.

*Road No. 48.—Township of Brower:*

Situate between Concessions 3 and 4, from Lot 1 to the Grand Trunk Pacific Railway  $1\frac{1}{4}$  miles, and across Lots 6 to 12,  $3\frac{1}{2}$  miles. This road was cut this season, grubbed and burning completed over Lots 1, 2, and part of 3, 11 and 12. Lots 11 and 12 (1 mile) were well ditched and graded.



A Settler and Local Mill Owner, Mr. Genier, on Lot 19, Concession 11, Glackmeyer,  $8\frac{1}{2}$  miles north-east of Cochrane.

*Road No. 49.—Township of Brower:*

Situate between Concessions 2 and 3, across Lots 1 and 2, in all one mile. This road was cut last season (1912) but not burned. This year it was burned and graded.

*Road No. 50.—Township of Fox:*

Situate along the west boundary across Concessions 1 and 2, in all 2 miles. This road was cut last season (1912) but not burned. This season Concession 2 was burned off.

*Road No. 51.—Township of Fox:*

Situate between Lots 6 and 7, across Concessions 2 and 3, to the Grand Trunk Pacific Railway, a distance of  $1\frac{1}{2}$  miles. This road was cut and grubbed this season, but not burned.

*Road No. 52.—Township of Fox:*

Situate along the south boundary across Lots 12 and 11, one mile. This road was cut last season (1912), but was not burned. This season this road was burned off.

*Road No. 53.—Township of Fox:*

Situate between Concessions 3 and 4, across Lots 2 to 11, a distance of  $5\frac{1}{4}$  miles. This road was cut, well grubbed and most of the timber and brush burned off. There remains a little burning to be done on Lots 2 to 7.



Town of Cochrane at the Junction of the Temiskaming and Northern Ontario and Grand Trunk Pacific Railways.

*Road No. 54.—Township of Sargent:*

Situate along the north side of the Grand Trunk Pacific Railway, across Lots 1 to 34, both inclusive, a distance of 10.91 miles. Part of this road, lots 14 to 34 inclusive, 6.58 miles, was cut season of 1912, but not burned off. This season the burning was completed over last season's work and the road cut, well grubbed and the burning completed across Lots 1 to 12 inclusive and to the Quebec boundary, a distance of 2.33 miles. The road is now nearly all ready for ditching and grading.

*Road No. 55.—Township of Sargent:*

Situate between Lots 4 and 5 across Concessions 5, 6 and 7, 2.35 miles. This road was cut, well grubbed and most of the burning completed and is now ready for grading, except part of Concession 5.



*Road No. 56.—Township of Calvert:*

Situate along the Temiskaming & Northern Ontario Railway spur from Porquois Junction (Iroquois Falls) into the Abitibi River Pulp and Paper Mills at Iroquois Falls, 6.36 miles. This work was done this season. The road commences on the north boundary of the Township of Clergue and extends north between Lots 9 and 10, Township of Calvert, to the Temiskaming and Northern Ontario Spur to the Abitibi River. It then parallels the railway on the south-east side for a little over five miles, then crosses the railway and follows the north-west side into the Pulp Company's yards and townsite. This road was cut out, corduroyed, ditched and graded; 6 bridges were constructed and 14,970 feet of corduroy laid.



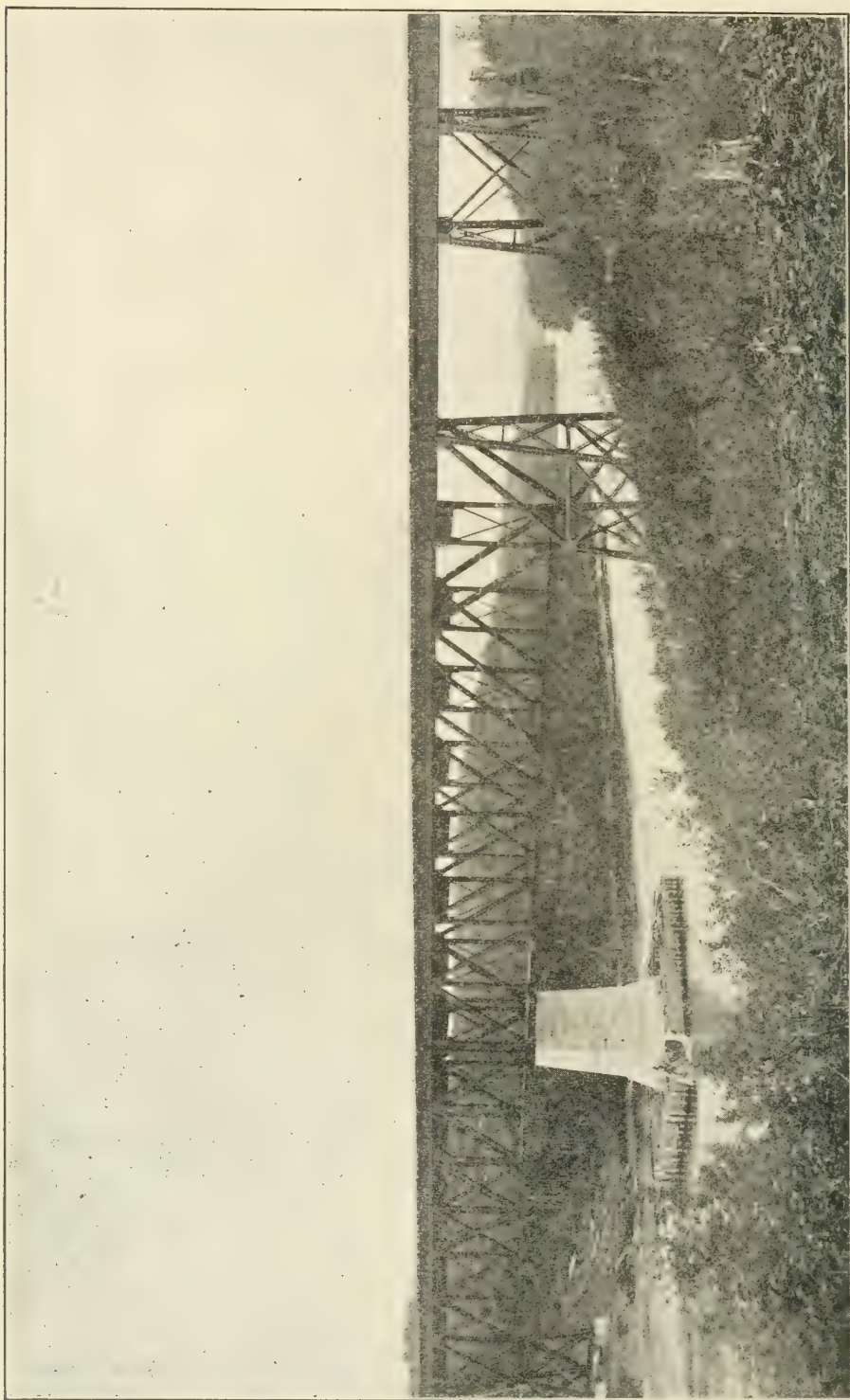
A Typical View of the White Birch and Poplar Lands in the Valley of the Abitibi, Township of Brower.

*Road No. 57.—Township of Clergue:*

Situate along the north boundary across Lots 1 to 12, both inclusive, six miles. This road was cut season 1912, but was not burned off. This season the burning and grubbing were completed over Lots 5 to 12, and the road well ditched and graded across Lots 7 to 12 and part of 5 and 6, a distance of  $3\frac{1}{2}$  miles. A pile bridge was built over creek on Lot 9.

*Road No. 58.—Township of Clergue:*

Situate midway on Lot 10, Concession 6, from road between Lots 10 and 11 to Temiskaming and Northern Ontario Railway station at Porquois Junction, a distance of 20 chains. This road was cut but not all grubbed or burned.



Banks of the Abitibi River at the Grand Trunk Pacific Railway Crossing.

*Road No. 59.—Township of Clergue:*

Situate between Concessions 3 and 4, across Lots 1 to 10, five miles. This road was cut last season (1912) but not burned off. This year the burning was completed across Lots 1 to 9, both inclusive,  $4\frac{1}{2}$  miles, and the road was well ditched and graded across part of Lot 3 and all of Lots 4 to 8 and part of 9,  $3.12$  miles. A pile bridge was built over Meadow Creek on Lot 7.

*Road No. 60.—Township of Clergue:*

Situate between Lots 6 and 7, across part of Concession 1, all of Concessions 2 to 5 and part of 6. This road was all cut season 1912 but not burned off. It was also partly graded across Concession 4. This season the burning was all completed and the road well ditched and graded across Concessions 2 and 3, two miles. A pile bridge was built over Meadow Creek, Concession 5.



A Trunk Road one mile north-east of the Town of Cochrane, showing the Taylor Farm.

*Road No. 61.—Township of Clergue:*

Situate along the east boundary across Concessions 4 to 6, three miles. This road was cut last season (1912) across Concession 4 and 55 chains of Concession 5, but no burning had been done. This season it was all burned and the road cut north across Concession 6 and grubbed, but the burning was not all completed.

*Road No. 62.—Township of Clergue:*

Situate along the east side of the Temiskaming and Northern Ontario Railway from Porquois Junction south to mile post 220,  $3\frac{1}{2}$  miles. This road was cut, grubbed and most of the burning completed;  $1\frac{1}{4}$  miles of ditching was done on this road and  $\frac{1}{4}$  mile of corduroy laid. A pile bridge was built over creek on Lot 9.



*Road No. 63.—Township of Dundonald:*

Situate along the north boundary, for  $5\frac{1}{2}$  miles. This road was cut last season (1912) but was not burned. This season the road was burnt off and Lot 1, one half mile, was well grubbed and graded.

*Road No. 64.—Township of Matheson:*

Situate between Lots 6 and 7, across Concessions 1 to 6, both inclusive, six miles. This road was cut this season and the burning nearly completed.

*Road No. 65.—Township of Matheson:*

Situate between Concessions 3 and 4, across Lots 1 to 10, both inclusive, in all 5 miles. This road was cut this season, grubbed and the burning nearly completed.



Field of Oats, north of Cochrane, Township of Glackmeyer.

*Road No. 66.—Townships of Machin and Fauquier:*

Situate along the north side of the Grand Trunk Pacific Railway from the Ground Hog River west for  $4\frac{3}{4}$  miles through the townships of Machin and Fauquier. This road was cut, well grubbed and all burned off, ready for grading.

*Road No. 67.—*

Situate between the town of South Porcupine and McArthur Lake, in the township of McArthur, a distance of twenty miles. About three miles of this road was partly cut out two years ago by the Colonization Road Branch. The old road was widened and repaired and the road continued to the lake. The last or south six miles was cut 20 feet wide, but suitable as winter road only. The balance of the road is well grubbed and all low places corduroyed. Bad hills were

cut down and the road fairly well graded. Four bridges were built. The road was constructed for the benefit of mine owners operating in the townships of Tisdale, Whitney, Delora, Shaw, Adams, Eldorado and McArthur, through which this road passes.

*Road No. 68.—Town of Cochrane:*

In order to reach the Union Station in the town of Cochrane, it was necessary to grade certain streets which had been laid out but not improved by the municipality.

Fourth Street was produced east to the line between Lots 18 and 19, township of Glackmeyer, from Eleventh Avenue, 1,660 feet.

The main Trunk Road from east and north-east enters the town by Fourth Street, thence north along Eleventh Avenue to Fifth Street, 600 feet; thence west



Garden at the Ground Hog River, Headquarters Fauquier Brothers, Contractors, Transcontinental Railway, July 15th.

along Fifth Street to the Lake Shore Road; thence following the Lake Shore Road along the north shore of Commando Lake to Sixth Avenue, 1,800 feet.

In order to get an outlet to the townships to the north-western part of the town of Cochrane, part of Third Avenue, part of Seventh Street, and part of Second Avenue had to be graded: in all a distance of 1,600 feet. Four hundred yards of gravel was used in re-surfacing the Lake Shore along the Commando Lake.

*No. 69.*

The Driftwood River, a tributary of the Black River, flowing through the townships of Walker, part of Clergue, Taylor and Stock, was cleared of driftwood so as to enable the settlers in these townships to navigate the river in the summer season in small boats and to enable them also to drive their pulpwood to the Abitibi Pulp Mills at Iroquois Falls on the Abitibi River. The river, as its name implies, was full of driftwood at several points, log jams having been formed through which it was impossible to drive logs or navigate boats.



ROADS IN THE DISTRICT OF TEMISKAMING, EAST AND WEST  
ALONG THE TEMISKAMING AND NORTHERN ONTARIO  
RAILWAY, FROM EARLTON NORTH TO MONTEITH.

Number of miles constructed, graded and old roads improved—150.

Amount expended \$185,612.61

*Township of Walker:*

Line between Concessions 1 and 2 across Lots 3 to 10 inclusive and between Lots 10 and 11, across the south half of Concession 2, and across the centre parts of Lots 11 and 12;  $5\frac{1}{2}$  miles. The road was cut out and burned and  $3\frac{1}{2}$  miles graded.

*Townships of Walker and Clergue:*

Town line between Walker and Clergue. This road was cut out and partly graded last season; this season the road was burned off and  $2\frac{3}{4}$  miles of the grading completed.

*Townships of Taylor and Walker:*

Town line between Taylor and Walker, across Lots 5 to 12, both inclusive, and across part of Lot 1 to the Driftwood River, between Stock and Clergue; also road between Lots 8 and 9, Concession 1, Walker, and between 8 and 9, north part of Concession 6, Taylor;  $5\frac{1}{4}$  miles. The road was cut out and grubbed and burned.

*Townships of Taylor and Stock:*

Line between Concessions 5 and 6 from Lot 1, Taylor, to Lot 5, Stock,  $8\frac{1}{2}$  miles. The road was cut out and burned. The road was graded from Lot 8 to 12, Taylor, both inclusive. The road between Lots 8 and 9, across the south part of Concession 6, half a mile was ditched.

*Township of Taylor:*

Line between Concessions 2 and 3, across Lots 1 to 7, both inclusive,  $3\frac{1}{2}$  miles. The road was cut out and grubbed and  $2\frac{1}{2}$  miles burned.

Line between Lots 4 and 5, across Concession 3 and part of Concession 2,  $1\frac{3}{4}$  miles. The road was cut out.

Road between Concessions 4 and 5, across Lots 2, 3, 4 and 5, two miles. The road was cut out and graded. Also road between Concessions 4 and 5, across Lots 7, 8, 9, 10 and part of 11, to the Driftwood River. The road was cut out and grubbed and half a mile graded. Also road between Lots 8 and 9, across Concession 5; cut out, grubbed and burned. A bridge 108 ft. in length was constructed across the Driftwood River on line between Concessions 5 and 6, Lot 1, Stock; also a bridge between Concessions 4 and 5, Lot 11, Twp. of Taylor.

*Townships of Taylor and Currie:*

Town line between Taylor and Currie, across Lots 7 to 12 inclusive. Graded three miles.

*Townships of Carr and Taylor:*

Town line between Carr and Taylor, across Concessions 1 and 2, two miles. The road was cut out,  $1\frac{1}{2}$  miles of which was graded.



*Township of Carr:*

Line between Concessions 2 and 3 across Lots 1 to 8. Cut and graded four miles.

Line between Lots 4 and 5, across Concessions 1, 2, 3, 4 and part of 5,  $4\frac{1}{2}$  miles. The first  $3\frac{1}{2}$  miles were cut out and graded, and the last mile cut and grubbed only.

*Townships of Carr and Beatty:*

Town line between Carr and Beatty, across Concessions 1, 2, 3 and part of 4,  $3\frac{1}{2}$  miles. The road was cut out last season but not burned. This season the road was burned off and graded  $3\frac{1}{2}$  miles.

*Township of Bowman:*

Line between Lots 6 and 7, across Concessions 4, 5 and 6, three miles. The road was cut out and grubbed, and  $1\frac{1}{2}$  miles graded. Also road between Concessions 3 and 4, across Lot 7,  $\frac{1}{2}$  a mile; also road between Concessions 4 and 5, across Lots 7 and 8, 1 mile; also road between Concessions 5 and 6, across Lots 7 and 8, one mile. The roads were cut out, grubbed and burned.

Line between Lots 4 and 5, across Concessions 4 and 5; also road between Concessions 3 and 4, across Lot 4 and half of Lot 3, a total distance of  $2\frac{3}{4}$  miles. The road was cut out and grubbed.

*Townships of Bowman and Currie:*

Town line between Bowman and Currie, across Concessions 6 and 5. The road which was cut out last season was burned off and graded this season; also a truss bridge 55 feet span was built over the Wahtaybeg River on Concession 5.

*Township of Hislop:*

On the town line between Hislop and Bowman. This road was cut in 1912, and this season the timber was burned off across Concessions 4, 3, 2 and 1. Concessions 4, 3 and half of 2 were graded  $2\frac{1}{2}$  miles.

The town line between Hislop and Beatty across Lots 6 to 13 inclusive, also town line between Bowman and Carr, across Lots 1, 2 and 3, to the town of Matheson was improved. The road was constructed several years ago, and was widened from 18 feet to 24 feet, and regraded in places covering a distance of six miles.

Road between Lots 11 and 12, Concession 6, one mile, between Concessions 5 and 6, across Lots 9, 10 and 11,  $1\frac{1}{2}$  miles;  $2\frac{1}{2}$  miles of this road cut and burned,  $1\frac{1}{2}$  miles graded

*Township of Playfair:*

On the north boundary of Playfair a road was cut out in 1912. This season the timber was all burned off for a distance of six miles. Seven culverts were constructed and one bridge with a span of 25 feet partially constructed.

*Trunk Road along Temiskaming and Northern Ontario Railway:*

Along the Temiskaming and Northern Ontario Railway right-of-way through part of the townships of Taylor and Carr from the line between Concessions 4 and

5, Taylor, to the Town of Matheson, a distance of eight miles; seven miles graded and one mile partly graded. On this section of the road three bridges were constructed with lengths of 120 feet, 40 feet and 20 feet.

From the town of Matheson, through part of the townships of Bowman and Hislop, continuing along the right-of-way of the Temiskaming and Northern Ontario Railway, eight miles. The timber was burned off, four miles graded and three miles re-graded. Thirty-four culverts were constructed and two small pile bridges built, each 20 feet span.

Continuing through the township of Playfair to the town line between Playfair and Cook, five miles. Ten culverts were constructed, timber on the right-of-way was burned off and one-half mile graded. Two 16-foot approaches were built on the east side of bridge constructed in 1912 across the Black River on Lot 4. In July last during the extremely dry season this bridge was burned, notwithstanding the fact that the foreman and his men were on the spot protecting it. In order, however, to save a settler's house and family, they were forced to leave the bridge, and in their absence the bridge was destroyed.

#### *Sesekinika Road:*

Commencing at Sesekinika Station on the Temiskaming and Northern Ontario Railway, on Lot 9, Concession 1, township of Maisonville, the road runs north-west along the right-of-way of said railway, crossing the same at the west side, and continuing west across part of Lot 10 and Lot 11, Concession 2, to Lot 12, thence south between Lots 11 and 12 in the said Concession to the line between Concessions 1 and 2,  $2\frac{1}{2}$  miles. This road was cut out the full width, stumped, grubbed and burned 30 ft., and one mile graded. Eight culverts and one small bridge were constructed thereon. This road was constructed to allow settlers in the south-west part of Maisonville to reach the railway station.

#### *Kirkland Lake Mining Road:*

Commencing at the village of Swastika, on the Temiskaming & Northern Ontario Ry., and running north-east through the township of Teck along the south shore of Kirkland Lake to the Township of Lebel, as far as Tough-Oakes Mines, seven miles. The road was cut out 50 feet wide and graded 26 feet wide. A bridge in the village of Swastika passing under the railway bridge across a tributary of the Blanche River was constructed 66 feet long, and one truss bridge 40 feet span across Trout Creek and 67 culverts were also constructed on this road, together with one mile of cross-lay. The road is well graded, and in places surfaced with gravel. It passes through a rocky country, timbered chiefly with Jack pine, poplar, birch and small spruce; little or no agricultural land is met with along this road. A small mining village has sprung up at Kirkland Lake, and considerable mining operations are being carried on.

#### *Townships of Boston and Lebel:*

Commencing on town line between Boston and Otto between Concessions 4 and 5 and running north-west through the townships of Boston and Lebel to the Dane Mining Camp. This was an old winter road cut out about 12 feet, which was improved to 40 feet wide and graded 20 feet wide for a distance of  $3\frac{1}{2}$  miles.

*Townships of Dack and Robillard:*

Widened grade and improved the road on the town line between the townships of Dack and Robillard, across Concessions 5 and 6, and constructed one floating bridge 100 feet in length.

*Townships of Dack and Chamberlain:*

Town line between Chamberlain and Dack across Lots 5 to 12, both inclusive, four miles. Road cut out and graded.

*Township of Chamberlain:*

Cut out, grubbed and graded road between Concessions 1 and 2, across Lots 1, 2, 3 and 4. Also road between Lots 2 and 3, across Concessions 3, 2 and north half of Concession 1, a distance of  $4\frac{1}{2}$  miles. This road was all graded with the exception of half a mile between Concessions 1 and 2.

Eight large culverts were constructed on the north boundary of the township across Lots 1 to 6 and the grades cut down.

The road on the west boundary of the township was widened, graded and improved, and continuing north between the townships of Pacaud and Marquis to the Blanche River about the centre of Concession 5, a total distance of  $10\frac{1}{2}$  miles.

*Township of Savard:*

The road between Concessions 1 and 2, across Lots 1, 2, 3 and 4, two miles, cut out, grubbed and burned, and graded half a mile.

Cut out, grubbed and ready for grading lines between Lots 6 and 7, across Concessions 1 and 2; line between Concessions 2 and 3, across Lots 7 and 8; line between Lots 8 and 9, across Concession 3. Total distance of four miles.

*Township of Robillard:*

Stumped, grubbed and graded the road between Concessions 4 and 5 from the East town line to Long Lake; five miles; and north-west along the north shore of the said lake to the west town line, one mile. Thence north along the west town line across Concession 6, Robillard, and Concession 1, Savard, two miles cut, grubbed and burned.

*Townships of Pacaud and Catherine:*

On the town line between Pacaud and Catherine the road was cut out and graded half a mile, part of Concession 3.

*Township of Marter:*

Constructed culverts and improved and widened the grade on the town line between Marter and Evanturel, across Lots 5 to 10 inclusive; also improved the grades, widened road and re-graded the road between Lots 4 and 5, across Concession 1 and part of Concession 2; also graded road between Concessions 4 and 5, across Lots 1, 2 and half of Lot 3,  $1\frac{1}{2}$  miles; also re-graded road across Concessions 4, 5, and 6, between Lots 4 and 5, three miles; and cut out the town line between Marter and Catherine across Lots 1, 2, 3 and 4, two miles; also burned off timber on road between Concessions 3 and 4, across Lot 4 and half of Lot 3, and on the road passing through the centre of Lot 3,  $1\frac{1}{2}$  miles.



Road between Lots 10 and 11, across Concessions 1 and 2, graded and improved, two miles; also graded and improved road between Concessions 2 and 3, across Lots 9 and 10, one mile; also graded and improved road between Lots 8 and 9, across Concession 3, one mile; also graded and improved road between Concessions 3 and 4, across Lots 8 to 11 inclusive, two miles; also cut out and stumped road between Lots 8 and 9, across Concessions 4 and 5, two miles.

*Township of Evanturel:*

Road between Concessions 1 and 2, across Lots 1, 2, 3 and 4, two miles, cut out, burned and grubbed.

Town line between Evanturel and Armstrong, across Lots 1 to 6, both inclusive, three miles; and the town line between Ingram and Hilliard, across Lots 1, 2, 3 and 4 and part of 5 to the Blanche River,  $2\frac{1}{4}$  miles; cut out, grubbed and burned.

*Township of Ingram:*

Cut out and graded road between Concessions 2 and 3, across Lots 1, 2, 3 and 4, two miles.

*Township of Armstrong:*

Road between Concessions 5 and 6, across Lots 1, 2, 3, 4 and 5,  $2\frac{1}{2}$  miles; cut out and burned.

*Earlton and Heaslip Road:*

Commencing at the Village of Earlton and running north along the east side of the right-of-way of the Temiskaming and Northern Ontario Railway to the north boundary of the township of Armstrong; thence east along the town line between Armstrong and Evanturel, which road is above described, to the line between Lots 4 and 5, township of Evanturel, and continuing north along the said line across Concessions 1, 2 and 3 to a point on the line between Concessions 3 and 4, Evanturel, half a mile east of the Village of Heaslip, 6 miles in all. The road was cut out and graded.

*South Lorrain Road:*

From the town of Haileybury a road was partly cut out for a distance of two miles.

J. F. WHITSON,  
Road Commissioner.

THE HON. W. H. HEARST,  
*Minister of Lands, Forests and Mines.*

SIR,—I beg to recommend the expenditure of the following amounts under 2 Geo. V. Chap. 2, on the construction of new roads, repairing and finishing of old roads, the construction of bridges and the clearing of a small farm for experimental purposes in Ground Hog Valley, during the season of 1914.

*District of Rainy River.*

In the Rainy River Valley, to complete and re-surface roads constructed last season, also the opening up of new roads tributary to the trunk roads constructed last season ..... \$85,000

*District of Kenora.*

Completing the trunk road north-west of the towns of Kenora and Keewatin, which was partially constructed last season, also the construction of new roads in the agricultural section north-east and north-west of Dryden and in the vicinity of Vermilion Bay ..... 35,000

*District of Port Arthur.*

Re-surfacing trunk roads graded last season, the construction of short roads adjacent to the trunk roads constructed last season, also construction of new roads in and north of the Township of Dorion on the C. P. R.... 60,000

*District West of Fort William.*

The extension of the trunk roads begun last season, re-surfacing and gravelling portions of the trunk roads partly constructed last season, including the Pigeon River or International Boundary and Duluth Road, also the construction of a bridge across the Kaministiquia River..... 90,000

*Sudbury and Sault Ste. Marie Trunk Road.*

Finishing road between Echo Bay and Blind River under construction last season, also continuing the trunk road between Blind River and Worthington ..... 90,000

*District of Sudbury.*

Re-surfacing part of the trunk roads constructed last season in the Blezard and Chelmsford Valleys, construction of new trunk roads through Blezard Valley, the completion and extension of the West Shining Tree Mining Road, the repairing of Long Lake Mining Road ..... 50,000

*Sudbury and North Bay Trunk Road.*

The construction of a trunk road from Sturgeon Falls west to Sudbury, . . . . . 50,000

*North Bay and Mattawa Trunk Road.*

Re-surfacing part of the old road, the construction of a trunk road from Callander south to Powassan, the construction of a bridge across the Amable du Fond River on the North Bay and Mattawa Road. . . . . 50,000

*Haileybury and South Lorrain.*

Mining and agricultural road in the South Lorrain Mining District and farming section, west of Lake Temiskaming . . . . . 15,000

Mining road from the Elk Lake Branch of the T. & N. O. to Maple Mountain Mining Section and other mining roads in the vicinity of Elk Lake. . . . . 20,000

Completing South Porcupine mining road and other mining roads on the vicinity of Porcupine . . . . . 20,000

Colonization roads in the vicinity of Long Lake west of Charlton, including three large bridges . . . . . 35,000

*Temiskaming and Northern Ontario Railway.*

Roads along the T. & N. O. Ry. from Englehart north to Cochrane and extending west as far as Charlton and Porcupine and east as far as the agricultural land extends, including the construction of a bridge on White River. . . . . 120,000

*Transcontinental Railway.*

Roads along the Transcontinental Railway from the Quebec boundary west to Hearst, to cover also the construction of ferries across the Abitibi and Frederick-house Rivers, to cover the completion of roads cut out last season, the construction of new roads where settlement has taken place, and the opening up of new roads where immediate settlement is likely to take place. . . . . 105,000

A proper survey and location of proposed trunk road along the Ottawa River from Mattawa to Pembroke . . . . . 15,000

*Larder Lake Mining Road.*

Repairing and extending the Larder Lake Mining Road . . . . . 5,000

For clearing small experimental farm in the valley of the Ground Hog River on the Transcontinental Railway, where there is a large area of rich clay soil, this with a view to testing the climatic conditions of that section of the country, to cover also the expense of making additional accurate tests of the soils in the different sections throughout the Clay Belt . . . . . 3,000



Unforeseen work, exploration and surveys of new roads, renewing of old bridges and construction of new roads. ....	77,000
Office and engineering expenses, equipment and plant .....	25,000
	<hr/>
	\$950,000
	<hr/>

I have the honor to be, Sir,

Your obedient servant,

J. F. WHITSON,  
*Road Commissioner.*









TWENTY-THIRD ANNUAL REPORT  
 OF THE  
**ONTARIO BUREAU OF MINES, 1914,**  
 BEING  
 VOL. XXIII.

CONTENTS :

PART I										PAGE
STATISTICAL REVIEW	-	-	-	-	-	-	-	-	-	1-51
MINING ACCIDENTS	-	-	-	-	-	-	-	-	-	53-109
MINES OF ONTARIO	-	-	-	-	-	-	-	-	-	110-193
NOTES ON THE ROCKS AT LEVACK	-	-	-	-	-	-	-	-	-	194-201
THE PRE-CAMBRIAN ROCKS NORTH OF LAKE HURON	-	-								202-236
THE CHEMICAL COMPOSITION OF NATURAL GAS FOUND IN										
ONTARIO	=	=	=	=	=	=	=	=	=	237-273

PART II										
THE KIRKLAND LAKE AND SWASTIKA GOLD AREAS	-	-								1-39

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# CONTENTS

## PART I.

	PAGE	STATISTICAL REVIEW— <i>Continued.</i>	PAGE
LETTER OF TRANSMISSION .....	ix	Stone Quarries .....	28
INTRODUCTORY LETTER .....	xi	Marble and Granite Quarries ..	29
STATISTICAL REVIEW .....	1	Sand and Gravel .....	30
Table I, Mineral Production of Ontario, 1913 .....	3	Portland Cement .....	30
Table II, Comparative Value of Mineral Production, 1912 and 1913 .....	4	Portland Cement Plants.....	30
Table III, Mineral Production, 1909 to 1913 .....	5	Other Minerals and Mineral Products .....	31
Table IV, Total Production of Metals in Ontario .....	6	Arsenic .....	31
Gold .....	6	Refiners of Cobalt-Silver Ore, Producers of White Arsenic ..	31
Hollinger Mine .....	6	Iron Pyrites .....	31
Dome Mine .....	7	Iron Pyrites Producers, 1913 ....	31
Porcupine Crown .....	8	Gypsum .....	31
Kirkland Lake .....	9	Gypsum Mines .....	31
Other Gold Areas .....	9	Salt .....	32
Table, Gold Mining Companies, 1913	10	Salt Companies .....	32
Silver .....	10	Calcium Carbide .....	32
Shipments .....	12	Corundum .....	32
Concentration of Ore .....	12	Feldspar .....	32
Silver Smelters .....	13	Feldspar Mines .....	32
Markets and Prices .....	14	Graphite .....	33
Table V, Silver Production, Cobalt Mines, 1904 to 1913 .....	15	Graphite Properties .....	33
The Subsidiary Constituents ...	15	Quartz .....	33
Table VI, Total Production, Cobalt Mines, 1904 to 1913 .....	16	Quartz Producers .....	33
Profits and Dividends .....	16	Talc .....	33
Table VII, Dividends and Bonuses declared to December 31st, 1913, by Cobalt Silver Mines and Porcupine Gold Mines .....	17	List of Talc Producers in Ontario, 1913 .....	33
Nipissing .....	18	Peat Fuel .....	33
Coniagas .....	18	Peat Plants .....	33
Seneca-Superior .....	18	Mica .....	34
Crown Reserve .....	18	List of Mica Mines and Companies .....	34
Kerr Lake .....	18	Petroleum .....	34
Cobalt Townsite .....	18	Petroleum Production by Districts, 1909 to 1911 .....	35
La Rose .....	18	Petroleum and Petroleum Products, 1909 to 1913 .....	35
McKinley-Darragh-Savage .....	18	Natural Gas Industry in 1913 ....	35
Table, Silver Producing Companies, 1913 .....	19	Regulations Concerning Gas and Oil Wells .....	36
The Market for Cobalt .....	19	List of Natural Gas Producers in 1913 .....	37
Bounties on Cobalt and Nickel ..	20	Mining Revenue .....	38
Nickel .....	20	Mining Lands Sold and Leased for Year ending October 31st, 1913	39
Progress of Nickel Mining ....	20	License and Recording Fees ...	39
Table VIII, Nickel-Copper Mining, 1909 to 1913 .....	21	Royalties .....	39
Platinum and Palladium .....	21	Amount Collected on Account of Supplementary Revenue Act, 1907, for the year ending October 31st, 1913 .....	39
Iron Ore .....	21	Operation of the Mining Tax Act, R.S.O., 1914, Chapter 26, formerly called The Supplementary Revenue Act .....	40
Table, Iron Mining Companies, 1913	22	Mining Companies .....	40
Pig Iron and Steel .....	22	Mining Companies Incorporated in 1913 .....	41
Table IX, Production Iron and Steel, 1909 to 1913 .....	22	Mining Companies Licensed in 1913	42
Materials of Construction .....	23	Radium .....	42
List of Clay-working Plants ....	23	Explanation Regarding Units of Measurement used in connection with Radium .....	43
List of Sand-lime Brick Manufacturers .....	27		
Lime Producers .....	27		

STATISTICAL REVIEW— <i>Continued.</i>	PAGE
Characters of Radium Ores.....	43
Discovery of Radio-Active Waters ..	45
Radium Associated with Salt ..	45
Discovery of Chrome Iron Ore and Diamonds .....	47
Mining Divisions .....	48
Kenora .....	48
Port Arthur .....	48
Sault Ste. Marie .....	48
Sudbury .....	48
Elk Lake .....	48
Gowganda .....	49
Timiskaming and Coleman .....	49
Larder Lake .....	49
Parry Sound .....	49
Porcupine .....	49
Provincial Assay Office .....	49
Schedule of Charges .....	50
Tariff of Fees for Analyses and Assays .....	50
 MINING ACCIDENTS IN ONTARIO IN 1913 .....	 53-109
Table of Accidents .....	53
Analysis of Fatalities at Mines ..	54
Table of Fatal Accidents in Mines, Metallurgical Works and Quarries, 1901-1913 .....	54
Cause and Place of Fatalities in Mines .....	55
Cause and Place of Non-fatal Accidents at Mines .....	56
Mining Regulations and How Observed .....	58
Falls of Ground .....	58
Shaft and Winze Accidents .....	59
Cages .....	60
Accidents from Explosives .....	60
Explosives .....	62
Caps .....	63
Fuse .....	63
Accidents Resulting from the Use of Explosives, 1913 .....	64
Miscellaneous Accidents .....	66
Surface Accidents .....	66
Fuse Troubles .....	66
Health of Miners .....	68
Ventilation of Mines .....	70
Treatment of Gassing .....	71
Mine Hospitals .....	72
Labor .....	73
Table of Fatal Accidents in or about the Mines, 1913 .....	74-75
Table of Non-Fatal Accidents in or about the Mines, 1913 .....	76-91
Accidents at Metallurgical Works. Cause and Place of Fatalities ..	92
Causes of Non-Fatal Accidents at Metallurgical Works .....	94
Occupation and Nationality of the Men Injured in Metallurgical Works .....	95
Table of Fatal Accidents at Metallurgical Works, 1913 .....	96-97
Table of Non-Fatal Accidents at Metallurgical Works, 1913 .....	98-105
Accidents at Quarries .....	106

MINING ACCIDENTS— <i>Continued.</i>	PAGE
Table of Fatal Accidents at Quarries, 1913 .....	108-109
Table of Non-Fatal Accidents at Quarries, 1913 .....	108-109
 MINES OF ONTARIO .....	 110-194
I. Northwestern Ontario .....	110-112
Northern Pyrites Mine.....	110
Canadian Homestake Gold Mine. ....	110
West Beaver Silver Mine .....	111
Elizabeth Gold Mine .....	111
Inter-Cities Quarries .....	111
Gowanlock Brick Company.....	112
II. Sudbury and the North Shore.....	112-128
Accidents .....	113
Canadian Copper Company .....	113
Creighton Mine .....	114
Crean Hill .....	114
No. 2 Mine .....	114
No. 3 Mine .....	116
Dill Quartz Quarry .....	116
Hospital .....	117
Mond Nickel Company .....	117
Mond Mine .....	117
Garson Mine .....	117
Frood Extension Mine .....	118
North Star Mine .....	119
Worthington Mine .....	120
Kirkwood Mine .....	120
Coniston Smelter .....	129
British-America Nickel Company ..	121
Murray Mine .....	121
Long Lake Gold Mine .....	122
Moose Mountain Iron Mine .....	123
Algoma Steel Corporation.....	124
Magpie Iron Mine .....	124
Helen Iron Mine .....	125
International Trap Rock Co....	127
III. Timiskaming .....	129-168
Cobalt and Vicinity .....	129
Concentrating Plants .....	129
Labor .....	130
Cobalt Silver Mines .....	130
Aladdin .....	130
Bailey .....	130
Beaver .....	130
Buffalo .....	132
Casey Cobalt .....	132
Chambers-Ferland .....	132
City of Cobalt .....	134
Cobalt Comet Mine .....	134
Cobalt Lake .....	134
Cobalt Townsite .....	136
Colonial .....	136
Coniagas .....	136
Crown Reserve .....	137
Drummond Fraction .....	138
Gould .....	138
Hargrave .....	138
Hudson Bay .....	139
Kerr Lake .....	139
La Rose Consolidated .....	141
Lumsden .....	144
McKinley-Darragh-Savage .....	144
Meteor .....	145
Nipissing .....	145
O'Brien .....	148
Penn-Canadian .....	149

MINES OF ONTARIO— <i>Continued.</i>	PAGE
Peterson Lake .....	149
Provincial .....	149
Right of Way .....	149
Seneca-Superior .....	153
Silver Bar .....	153
Timiskaming .....	153
Trethewey .....	154
York-Ontario .....	154
Elk Lake Area .....	154
Beaver Auxiliary .....	154
Cobalt Frontenac .....	155
Fleur de Lis .....	155
Forest City .....	155
Mapes-Johnston .....	155
Downey .....	155
Moose Horn .....	155
Paragon .....	155
Gowganda .....	156
Caleta .....	156
Dowling .....	156
Thompson-Gowganda or Gamey- Thompson .....	156
Hewitt .....	156
Mann .....	156
Miller Lake-O'Brien .....	156
Walsh .....	157
South Lorrain .....	157
Wetlaufer-Lorrain .....	157
Porcupine Gold Area .....	157
Acme Gold Mines, Ltd. ....	157
Dome .....	158
Dome Lake .....	159
Foley-O'Brien .....	160
Hollinger .....	160
Hollinger Reserve .....	163
McIntyre .....	163
Miracle .....	163
North Dome .....	163
North Thompson .....	163
Pearl Lake .....	164
Porcupine Crown .....	164
Porcupine Lake .....	165
Rea .....	165
Schumacher .....	165
Three Nations .....	165
Alexo Nickel Mine .....	167
Dane and Larder Lake Areas... Goldfields .....	167
La Mine D'or Huronia .....	168
Swastika and Kirkland Lake Areas Tough-Oakes .....	168
Wright-Hargraves .....	169
Teck-Hughes .....	170
Sylvanite .....	170
Burnside .....	170
Solid Silver .....	170
IV. Eastern Ontario .....	170
Iron .....	171
Belmont .....	171
Bessemer Mine .....	172
Child's Mine .....	172
Rankin-Coe Mine .....	172
Concentrating Plant .....	172
Orton .....	173
Gold .....	173
Cordova Mine .....	173
Golden Fleece .....	173
Ore Chimney .....	173

MINES OF ONTARIO— <i>Continued.</i>	PAGE
Iron Pyrites .....	174
Sulphide .....	174
Queensboro .....	174
Craig .....	174
Talc .....	174
Henderson .....	174
Gillespie Mill .....	175
Canadian Talc and Silica Com- pany .....	175
Connolly .....	176
Lead .....	176
Frontenac .....	176
North American Smelter .....	176
Buffalo and Ontario Smelter..	176
Feldspar .....	177
Richardson .....	177
Reynolds .....	177
Mica .....	177
Lacey .....	177
Taggart .....	177
Scott .....	178
Tett Bros. ....	178
Trimming Works .....	178
Graphite .....	178
Black Donald .....	178
Tonkin-DuPont .....	179
New York Graphite Company..	179
Fluorspar .....	179
Silver Refinery .....	179
Deloro Mining and Reduction Company .....	179
Electric Smelting Plant .....	179
Blast Furnaces .....	182
Standard Iron Company .....	182
Marble .....	182
Ontario Quarries .....	182
Limestone Quarries .....	183
Lehigh .....	183
Point Anne .....	183
Britnell Company .....	183
Ontario Rock Company, Ltd... Canada Lime Company .....	184
Toronto Brick Company .....	184
Hastings Quarry .....	184
Quinlan and Robertson .....	184
Tweed Quarries .....	184
Kingston Quarry .....	185
Delta Lime Company .....	185
Robillard's Quarry .....	185
Gosselin's Quarry .....	185
Eganville Quarry .....	185
York Sand and Gravel Com- pany .....	185
Excavations for Clay .....	185
Don Valley .....	185
V. Southwestern Ontario .....	186
Silver Refineries .....	186
Coniagas Reduction Company.. Canada Refining and Smelting Company .....	186
Blast Furnaces .....	187
Midland .....	187
Port Colborne .....	187
Parry Sound .....	187
Gypsum .....	188
Carson Mine .....	188
The Haldimand Gypsum Com- pany .....	188



MINES OF ONTARIO— <i>Continued.</i>		PAGE
Crown Gypsum Company	189	
Quarries	189	
Battle Quarry	189	
Canadian Quarries	189	
Canada Cement Company	189	
Cartmell Quarry	189	
Canada Crushed Stone Corporation	189	
Chalmers Quarry	189	
Empire Limestone Quarry	190	
Fleming Quarry	190	
Gallagher Lime and Stone Company	190	
Hagersville	190	
Hagersville Crushed Stone Company	190	
Harrison and Beatty	190	
Harvey	190	
Longford	191	
Logan	191	
Michigan Central	191	
Marshall	191	
Oliver and Webster	191	
Owen Sound Lime Works	191	
Queenston	191	
St. Mary's Horseshoe Quarry	191	
St. Mary's Portland Cement Company	192	
Standard White Lime Company	192	
Thames Quarry	192	
Toronto Lime Company	192	
Wentworth	193	
Welland County Lime Works	193	
Walker's Quarry	193	
Canada Iron Corporation	193	
Sand and Gravel	193	
NOTES ON THE ROCKS AT LEVACK. 194-201		
A. Sudburite	194	
B. Norite, The Nickel-Bearing Eruptive	196	
C. Altered or Transition Rocks	197	
D. Local Types, Partly Micropegmatitic	198	
E. Micropegmatite	198	
F. Laurentian, Granitoid-Gneiss, etc.	199	
G. Olivine-Diabase Dike	200	
Relationship of Sudburite to the Ore Deposit	200	
Points Confirming the Theory of Magmatic Segregation	201	
PREFATORY NOTE TO DR. COLEMAN'S PAPER. 202-203		
THE PRE-CAMBRIAN ROCKS NORTH OF LAKE HURON, WITH SPECIAL REFERENCE TO THE SUDBURY LINES. 204-236		
Introduction	204	
The Keewatin	206	
The Grenville Series	208	
The Kyanite Schists	209	
The Sudbury Series	211	
The Copper Cliff Arkose	212	
The McKim Greywacké	212	
The Wanapitei Quartzite	213	
Eruptives of the Sudbury Series	214	
PRE-CAMBRIAN ROCKS— <i>Continued.</i>		PAGE
Sudburite	215	
The Long Lake Region	217	
Long Lake Gold Mine	218	
Extensions of the Sudbury Series to the Southwest and West	219	
The Region of Lake Penage	219	
Section on the Algoma Eastern Railway	221	
South of Espanola	221	
Rocks near Killarney	222	
Gold Prospects near the Outlet of Whitefish River	224	
Westward Extension of the Sudbury Series along the Sault Railway	224	
Relations to the Laurentian	227	
The Basal Huronian Conglomerate	228	
Other Areas Probably of Sudburian Age	230	
Extent and Character of the Huronian Basal Conglomerate	232	
Relation of the Sudbury Animikie to the Huronian	234	
The Keweenawan	235	
Summary	235	
THE CHEMICAL COMPOSITION OF NATURAL GAS FOUND IN ONTARIO. 237-273		
Object of Investigation into Composition of Natural Gas	237	
General Considerations in Sampling Natural Gas	237	
Method of Sampling	238	
Troubles with Air Samples	239	
Mode of Sampling with Water	239	
Details of Sampling at the Well	240	
Difficulties of Sampling when Hydrogen Sulphide is Present in Gas	240	
History of Wells Sampled	241	
General Statement	241	
Essex Gas Field	241	
Kent Gas Field	241	
Wells Sampled	243	
Samples of the Surface Gas from the Drift taken in Kent	243	
Gas in Lambton County	244	
Gas in Elgin County	244	
The Welland-Haldimand-Norfolk-Brant Gas Field	244	
Details of Wells Sampled in Welland-Haldimand-Norfolk-Brant-Wentworth Gas Producing Area	244	
York, Scarboro Tp., Surface	246	
The Analyses of the Gases	247	
Methods of Analysis	247	
Apparatus Employed	248	
Detailed Method of Analysis	248	
Analysis by Liquefaction	251	
Table I. Analyses Ontario Natural Gases	254	
Composition of Natural Gas	255	
The Mathematical Theory of Combinations Applied to Natural Gases	256	
Variations in Artificial Gas	256	

THE CHEMICAL COMPOSITION OF NATURAL GAS— <i>Continued.</i>	PAGE
Determinations of the Variations in Natural Gas by Inspection.	257
Table II. Pennsylvania Gases ..	259
Variations in Composition of Natural Gas in Other Fields. Pennsylvania and West Vir- ginia .....	260
Table III. Gases from West Vir- ginia .....	261
Variations in Kansas Gas.....	261
Table IV. Kansas Gases .....	263
Calculation of the Probable Num- ber of Dry Gases .....	264
Probable Number of Different Gases in Ontario .....	265
General Discussion of Results of Analyses .....	265
Influence of Geological Formation	265
Influence of Declining Pressure on the Composition .....	266
Uniformity of Composition of Natural Gas in Ontario .....	266

THE CHEMICAL COMPOSITION OF NATURAL GAS— <i>Continued.</i>	PAGE
Surface Gas .....	267
Effect of Water on Natural Gas..	267
Oxygen in Water and Natural Gas .....	268
Relation of Surface Gas to the Deep Rock Gas .....	268
Influence of Drift or Surface Gas on Theories of Origin of Natural Gas .....	268
Miscellaneous Analyses of Natural Gas .....	270
Kansas Gas .....	270
Wyoming Gas .....	271
Gas from Russia .....	271
Examples of Natural Gas show- ing Oxygen .....	272
Analyses Illustrating Composi- tion of Gas from Oil Wells and "Wet" Gases .....	272
Incombustible Natural Gases ...	273

## ILLUSTRATIONS

	PAGE.
Cobalt—Silver vein uncovered in pumping out Kerr lake .....	xii
Port Colborne plant of the Canadian Furnace Company, Limited.....	52
No. 3 mine, Canadian Copper Company .....	115
New hospital of the Canadian Copper Company .....	116
Frood Extension mine .....	118
Construction of head frame at Worthington mine .....	119
Surface plant at Long Lake gold mine .....	122
General view of Moose Mountain mine .....	123
Roasting plant at Magpie mine in course of construction .....	124
View of tubes, Magpie roasting plant .....	125
General view of new plant at Helen mine .....	126
Steep Hill Falls power house, Michipicoten .....	126
Crushing and loading plant of International Trap Rock Company .....	128
Shipment of silver bullion from Buffalo mine .....	131
New high-grade mill at Buffalo Mines, Limited .....	131
Surface plant, Casey Cobalt mine .....	133
Surface plant, Porcupine Crown mine .....	133
40-stamp mill of Cobalt Lake Mining Company, Limited .....	135
Pumping out Kerr lake .....	140
50-stamp mill at the McKinley-Darragh mine .....	143
Nipissing low-grade mill .....	145
New 80-stamp mill of Northern Customs Concentrators, Limited .....	148
No. 2 shaft, Peterson Lake Silver Cobalt Mining Company, Limited .....	152
80-stamp mill at Dome mine.....	158
New mill and shaft house at Dome Lake mine .....	159
Flow sheet of McIntyre-Porcupine mill .....	161
McIntyre-Porcupine gold mine .....	162
Porcupine lake gold mine .....	165
Surface plant at Schumacher mine .....	166
Surface plant of Three Nations mine .....	166
Lucky Cross mill .....	167
Shafthouse at Tough-Oakes mine .....	168
Teck-Hughes gold mine, No. 1 shaft .....	169

LIST OF ILLUSTRATIONS.—( <i>Continued</i> ).	PAGE
Plant of Frontenac Floor and Wall Tile Company, Kingston .....	171
Henderson talc mine, Madoc, Ont. ....	175
Talc grinding mill at Madoc .....	176
Mill of the Tonkin Du Pont Graphite Company at Wilberforce .....	178
Electric furnace, Tivani Steel Company, Belleville .....	180
Parry Sound plant of the Standard Iron Company, Limited .....	182
Plant of Crown Gypsum Company at Lythmore .....	188
Moose Mountain iron mine .....	206
Keewatin iron formation, Moose mountain .....	207
Dam for lower power plant, Wanapitei river .....	211
Greywacké, Sudbury series .....	212
Sudbury quartzite, with granite to left .....	213
Greenstone near Murray mine, Sudbury .....	215
Pillow lava, sudburite, Elsie mine, Sudbury .....	216
Long lake shaft house .....	217
Long lake mill .....	218
Quartzite near Whitefish, A. E. Railway .....	222
Quartzite quarry, near Killarney .....	223
Quartzite quarry, near Killarney .....	224
View over Georgian bay from top of Cloche mountains .....	225
Sudbury quartzite and schist, near Granite, Cutler .....	226
Basal Huronian conglomerate, islands east of Thessalon .....	228
Quartzite and greywacké, Timiskaming series, Porcupine .....	230
Conglomerate, Timiskaming series, Porcupine .....	231
Smooth surface of quartzite under tillite, north of Ramsay lake .....	233
Gas sampling cylinder .....	239
Apparatus for gas analysis .....	248

## MAPS AND SECTIONS

	PAGE
Geological map of Peterson Lake Silver Cobalt Mining Company, Limited .....	150-151
Ideal section, Levack township .....	194
Sketch map showing pre-Cambrian formations north of Lake Huron. <i>To face</i> ....	204
Plan of a portion of Kent county .....	242
Map of part of the Province of Ontario showing position of gas wells sampled. <i>To face</i> .....	244
Parts of Pennsylvania and New York .....	259
Portion of West Virginia .....	260
Part of Kansas .....	262



## LETTER OF TRANSMISSION

TO HIS HONOUR SIR JOHN MORISON GIBSON, ETC., ETC., ETC.,  
*Lieutenant-Governor of the Province of Ontario.*

SIR,—I have the honour to transmit herewith, for presentation to the Legislative Assembly of the Province of Ontario, the Twenty-third Annual Report of the Bureau of Mines.

I have the honour to be, Sir,

Your obedient servant,

W. H. HEARST,  
*Minister of Lands, Forests and Mines.*

DEPARTMENT OF LANDS, FORESTS AND MINES,  
Toronto, March 31st, 1914.



## INTRODUCTORY LETTER

TO THE HONOURABLE WILLIAM HOWARD HEARST,  
*Minister of Lands, Forests and Mines, Toronto.*

SIR,—I beg to hand you herewith, to be presented to His Honour the Lieutenant-Governor in Council, the Twenty-third Annual Report of the Bureau of Mines, being for the calendar year 1913.

The production of minerals in 1913 was the largest on record, showing an increase in value over that of 1912 of ten per cent. During the last ten years the mines and mineral works of the Province have increased their output by 313 per cent., and during the past five years by 112 per cent. In 1913, gold shows the largest gain among the metals, 106.1 per cent., and Portland cement among the non-metallic substances, 21.9 per cent. The metallic production represents 70.5 per cent. of the whole. The yield of gold in 1913 was almost equal to the entire production of the metal from the time the first discovery was made in 1866 to the end of 1912. While there was a falling off in the production of silver from Cobalt, the mines show a wonderful record, the output since their discovery ten years ago representing two tons of silver for every working day during that period.

Part I, in addition to the statistical review of the mineral industry, contains descriptions of the mines of Ontario by Mr. T. F. Sutherland, Chief Inspector of Mines. A paper by Dr. A. P. Coleman describes the structural and age relations of the pre-Cambrian rocks north of Lake Huron, which are of great interest from both the scientific and economic points of view. Mr. G. R. Mickle, Mine Assessor, in co-operation with Professors W. H. Ellis, J. W. Bain and E. G. R. Ardagh, contributes an important paper on The Chemical Composition of Natural Gas Found in Ontario. This paper adds many interesting facts to our knowledge of this valuable substance.

In Part II Messrs. A. G. Burrows and P. E. Hopkins describe the Kirkland Lake and Swastika Gold Areas, which have during recent months attracted much attention.

A very important event of the year was the meeting of the Twelfth International Geological Congress. The sessions were held in Toronto in August, excursions to various points of Ontario and to other Canadian Provinces being made both before and after the sessions. The meeting did much to make Ontario's geology and mineral resources known to the nations of the world.

I have the honour to be, Sir,

Your obedient servant,

THOS. W. GIBSON,  
*Deputy Minister of Mines.*

DEPARTMENT OF LANDS, FORESTS AND MINES,  
Toronto, March 31st, 1914.



*Photo by A. A. Co*  
Cobalt-Silver vein uncovered in pumping out Kerr Lake



# STATISTICAL REVIEW

## of the

### MINERAL INDUSTRY OF ONTARIO FOR 1913

By THOS. W. GIBSON, Deputy Minister of Mines

Diversity of occupation exercises a favorable influence upon the development of a new country. No one industry, of course, is self-sufficient, and, in these days of increasing specialization, every industry tends to become more dependent upon and more necessary to all the others.

Naturally, the industries which first take root in a given area are those for which its resources are most evidently adapted. In a wooded country, such as northern Ontario, the first in order of time is lumbering. Where the land is good and railway access is afforded, agriculture comes at once upon its heels, closely followed, where there are workable minerals, by mining. Soon all three industries are found in various stages of development, each playing an important part in the settlement of the country. Felling the trees and hauling the logs give employment to the settler during the winter months and help him to earn some ready money. Lumberjacks and miners alike must be fed, and so there is a home market for all the farm produce which the settlers can raise beyond their own requirements. The settler is himself a lumberer so far as his own farm is concerned, and brings sawlogs, pulpwood, railway ties and fence posts to market. Buildings must be put up at farm and mine, and for these lumber is necessary.

Most of the lumberman's cut of sawlogs or the output of his sawmill is transported elsewhere to find a market, and this is the case also with the silver, gold, copper or nickel won from the mine. But in the production and handling of these commodities much labour and capital are called into use. Communities are formed, and industrial and social development goes on. Water powers, so numerous in northern Ontario, are compelled to furnish power, light and traction. Pulp and paper mills are erected to make use of the abundant supplies of spruce and poplar. Roads and railways are built. Schools, churches, hospitals, and other institutions with improvement and amelioration as their end, come into being. So too, unfortunately, do jails and blind pigs, for crime and excess accompany the human animal whether he is found in forest or mine or the crowded town.

A large proportion of the labour in mine and lumber shanty, and in railway and wagon road-making, is of the unskilled type, where muscle counts for more than mind. Very much of this is supplied by immigrants from foreign lands—chiefly those of continental Europe—and hence a surprisingly large share of the industrial population of the north is composed of Finns, Poles, Austrians, Italians, Bulgarians, etc. There are also Syrians in considerable numbers and Greeks, but they are usually in trade, and are rarely found engaged in manual labour. Whether or not the presence of large numbers of non-English-speaking labourers is wholly desirable, this is perhaps not the place to discuss, but the fact is they are there, and in response to a demand. Mine managers and railway contractors assert, and no doubt with truth, that they could not operate their mines or build their embankments were it not for this foreign labour. Anyone looking over the list of mining accidents in this Report, compiled by Mr. T. F. Sutherland, Chief Inspector of Mines, cannot but be struck with the large percentage of names of foreign origin. Doubtless there is a connection between this

fact and the comparatively high death and accident rate in the mines of the Province. In part this may be due to unfamiliarity with the English language and the difficulty of comprehending quickly spoken orders in an emergency. Mental traits have also to be reckoned with, and the fact that very few of these men were miners before coming to this country, or at any rate to this continent. Ignorance of the risks in mining and the handling of explosives, a certain lack of resourcefulness in the presence of danger, amounting almost to inertia or even stupidity, and other characteristics, contribute to the same result. The building up of a strong force of capable and experienced miners such as the mining industry of Ontario now imperatively requires, will be a slow process, but when accomplished it will mean very much for the effective and economical operation of our mines.

The production of minerals in 1913 was again the largest on record, amounting in "spot" value to \$53,232,311 as compared with \$48,341,612 in 1912—an increase of \$4,890,699 or 10 per cent. To show the large advances which the yearly output is now making, the figures for ten and five years ago may be cited. In 1903 the value of the production was \$12,870,593, and in 1908 \$25,019,373. Thus during the last ten years the mines and mineral works of the Province have increased their output by 313 per cent., and during the last five years by 112 per cent.

Of late years the chief annual gain has been in metals and metalliferous substances, due to the great development which has characterized mining for silver, nickel, copper and gold—in other words, to Cobalt, Sudbury and Porcupine. In 1913 both the metallic and non-metallic branches of the industry shared in the growth; in fact, while the former had a greater absolute advance, the latter showed a higher percentage of gain—15 per cent. as against 7.7 per cent. for the metallic division. In the aggregate, however, the metals bulk much more largely than the non-metals, contributing 70.5 per cent. of the total as compared with 29.5 per cent.

Following is Table I, which gives a summary of the production for the year and also the number of employees and the amount of wages paid in obtaining the various products.

Table I.—Mineral Production of Ontario, 1913

Product.	Quantity.	Value.	Employees.	Wages.
<b>Metallic:</b>				
Gold .....	ounces 220,837	\$ 4,558,518	1,470	\$ 1,571,425
Silver .....	" 29,724,931	16,579,094	911	3,613,403
Copper .....	tons 12,941	1,840,492	3,512	3,291,956
Nickel .....	" 24,838	5,237,477		
Iron ore .....	" 195,937	424,072	631	393,258
Pig iron .....	" 648,899	8,719,892	1,014	876,484
Cobalt oxide, etc. ....	lbs. (a) 1,188,526	420,386	318	258,817
Nickel do. ....	" (b) 232,255	13,326		
		37,793,257	10,856	10,005,343
Less Ontario iron ore (132,708 tons) smelted into pig iron.....		285,322		
Net metallic production.....		37,507,935		
<b>Non-metallic:</b>				
Arsenic, refined.....	lbs. (c) 2,450,758	64,146	(d)	(d)
Brick, common.....	No. 408,808,000	3,452,352	3,243	1,433,790
Tile, drain.....	" 16,935,000	292,767		
Brick, paving, etc. ....	" 18,547,000	243,119	741	461,326
Brick, pressed .....	" 81,238,000	919,741		
Stone, building and crushed.....		1,137,153	1,162	596,195
Calcium carbide.....	tons 2,052	123,100	38	31,741
Cement, Portland .....	bbl. 3,802,321	4,105,455	1,382	955,729
Corundum .....	tons 1,177	137,036	61	47,502
Feldspar .....	" 18,615	67,142	78	33,317
Graphite, refined .....	" 1,788	93,054	87	41,414
Gypsum .....	" 40,581	92,627	(e) 140	(e) 81,057
Iron pyrites .....	" 71,620	171,687	163	136,069
Lime .....	bush. 2,300,991	390,600	277	149,280
Mica .....	tons 386	55,264	72	27,950
Natural gas.....	million cub. ft. 12,516	2,362,021	402	289,480
Peat .....	tons 500	1,750	13	1,000
Petroleum.....	Imp. gal. 7,915,761	398,051	(f) 781	(f) 559,557
Pottery .....		52,875	38	21,751
Quartz .....	tons 54,320	130,860	90	57,501
Salt .....	" 96,799	474,372	234	172,691
Sewer pipe .....		600,297	245	160,903
Sand and Gravel.....	cub. yd. 425,978	233,567	162	77,475
Talc, ground.....	tons 20,738	125,340	50	37,369
Non-metallic production .....		15,724,376	9,459	5,373,097
Add metallic production .....		37,507,935	10,856	10,005,343
Totals.....		53,232,311	20,315	15,378,440

(a) The estimated quantity of metallic cobalt contained in the ores raised from the silver-cobalt mines was 377 tons; this includes the quantity converted into oxide.

(b) The estimated quantity of metallic nickel contained in the silver-cobalt ores was 821 tons, which is included in the quantity converted into oxide.

(c) The ores extracted from the Cobalt silver mines are estimated to have contained 3,633 tons of arsenic, which includes the quantity of refined arsenic given in the table.

(d) Included in cobalt and nickel oxide. (e) Including alabastine works. (f) Refining works.

Table II, given below, makes a comparison between the production of 1913 with that of 1912.

The greatest increase and the greatest decrease are both found among the metals. Gold shows the largest gain, \$2,444,432 (106.1 per cent.), and silver the largest falling off, \$1,092,824 (6.1 per cent.). Other gains in the metallic list are: copper, \$256,182, or 16.1 per cent.; nickel, \$501,017, or 10.5 per cent.; pig iron, \$665,523, or 8.2 per cent. No production of platinum, palladium or lead was reported for 1913.

Among the twenty-four non-metallic products, twenty show gains, and four losses, as compared with 1912. The largest advance is in Portland cement, \$739,796 (21.9 per cent.); other noticeable increases are in pressed brick (\$285,572, or 45 per cent.), common brick (\$274,102, or 8.6 per cent.), iron pyrites (\$100,644, or 141 per cent.). Notwithstanding the decrease in the production, the value of petroleum was greater by \$53,514 or 15.5 per cent. Sewer pipe is up by \$135,670 or 29.1 per cent., talc by \$63,982 or 104.2 per cent., gypsum by \$42,381 or 84.3 per cent., and building and crushed stone by \$183,314, or 19.4 per cent.

Decreases occur in arsenic (\$15,151 or 19.1 per cent.), corundum (\$96,176 or 41.2 per cent.) and quartz (\$48,716 or 27.1 per cent.). There was also a small decrease in mica.

Table II.—Comparative Value Mineral Production, 1912 and 1913

Product.	1912	1913	(I) Increase. (D) Decrease.
<b>Metallic:</b>			
	\$	\$	\$
Gold .....	2,114,086	4,558,518	I 2,444,432
Silver .....	17,671,918	16,579,094	D 1,092,824
Copper .....	1,584,310	1,840,492	I 256,182
Nickel .....	4,736,460	5,237,477	I 501,017
Iron ore .....	238,884	424,072	I 185,188
Pig iron .....	8,054,369	8,719,892	I 665,523
Cobalt .....	315,781	420,386	I 104,605
Nickel oxide .....		13,326	I 13,326
Platinum .....	80,736		D 80,736
Palladium .....	147,235		D 147,235
Lead .....	1,290		D 1,290
<b>Non-metallic:</b>			
Arsenic .....	79,297	64,146	D 15,151
Brick, common .....	3,178,250	3,452,352	I 274,102
"    paving, fancy, etc .....	221,986	243,119	I 21,133
"    pressed .....	634,169	919,741	I 285,572
Stone, building and crushed .....	953,839	1,137,153	I 183,314
Calcium carbide .....	120,000	123,100	I 3,100
Cement, Portland .....	3,365,659	4,105,455	I 739,796
Corundum .....	233,212	137,036	D 96,176
Feldspar .....	28,916	67,142	I 38,226
Graphite .....	65,076	93,054	I 27,978
Gypsum .....	50,246	92,627	I 42,381
Iron pyrites .....	71,043	171,687	I 100,644
Lime .....	281,672	390,600	I 8,928
Mica .....	57,384	55,264	D 2,120
Natural gas .....	2,268,022	2,362,021	I 93,999
Peat .....	725	1,750	I 1,025
Petroleum .....	344,537	398,051	I 53,514
Pottery .....	52,445	52,875	I 430
Quartz .....	179,576	130,680	D 48,716
Sand and Gravel .....		233,567	I 233,567
Salt .....	450,251	474,372	I 24,121
Sewer pipe .....	464,627	600,297	I 135,670
Talc .....	61,358	125,340	I 63,982
Tile, drain .....	279,579	292,767	I 13,188



Table III gives the value of the mineral production for each of the last five years, and a glance at the figures shows the steady advance which has been made during that period. The increase from 1909 to 1913 is \$20,250,936, of which the metallic division furnished \$14,579,439 and the non-metallic division \$5,671,497. The gain in the former was 63.5 per cent. and in the latter 56.4 per cent.

Table III.—Mineral Production, 1909 to 1913

Product.	1909	1910	1911	1912	1913
<b>Metallic:</b>	\$	\$	\$	\$	\$
Gold .....	32,445	68,498	42,637	2,114,086	4,558,518
Silver .....	12,464,722	15,481,322	15,953,895	17,671,918	16,579,094
Cobalt .....	94,965	54,699	170,890	315,781	420,386
Copper .....	1,127,015	1,374,103	1,281,118	1,584,310	1,840,492
Nickel .....	2,790,798	4,005,961	3,664,474	4,736,460	5,250,803
Iron ore .....	645,622	513,721	445,930	238,884	424,072
Pig iron .....	6,301,528	6,975,418	7,716,314	8,054,369	8,719,892
Zinc ore .....	8,950	5,760	.....	.....	.....
Lead .....	.....	.....	.....	1,290	.....
Platinum .....	.....	.....	.....	80,736	.....
Palladium .....	.....	.....	.....	147,235	.....
	23,466,045	28,479,482	29,275,258	34,945,069	37,793,257
Less value Ontario iron ore smelted into pig iron....	537,549	317,804	172,391	145,326	285,322
Net metallic production...	22,928,496	28,161,678	29,102,867	34,799,743	37,507,935
<b>Non-metallic:</b>					
Actinolite .....	.....	320	.....	.....	.....
Arsenic .....	61,039	70,709	74,609	79,297	64,146
Brick, common .....	1,916,147	2,374,287	2,801,971	3,178,250	3,452,352
" paving .....	73,700	70,648	86,685	221,986	243,119
" pressed .....	490,571	458,596	564,630	634,169	919,741
Building and crushed stone..	660,000	761,126	892,627	953,839	1,137,153
Calcium carbide .....	151,676	184,323	84,437	120,000	123,100
Cement, Portland .....	2,897,348	3,144,343	3,640,642	3,365,659	4,105,455
Corundum .....	140,817	171,994	147,158	233,212	137,036
Feldspar .....	36,204	47,518	51,610	28,916	67,142
Fluorspar .....	.....	15	200	.....	.....
Graphite .....	37,624	55,637	36,492	65,076	93,054
Gypsum .....	23,604	17,825	32,535	50,246	92,627
Iron pyrites .....	78,170	98,353	118,457	71,043	171,687
Lime .....	470,858	474,531	402,340	381,672	390,600
Mica .....	73,124	85,294	43,058	57,384	55,264
Natural gas .....	1,188,179	1,491,239	2,186,762	2,268,022	2,362,021
Peat fuel .....	240	1,284	2,830	725	1,750
Petroleum (crude) .....	559,478	368,153	353,573	344,537	398,051
Phosphate of lime .....	1,904	.....	240	.....	.....
Pottery .....	43,214	51,485	50,500	52,445	52,875
Quartz .....	75,329	87,424	64,405	179,576	130,860
Sand and gravel .....	.....	.....	.....	.....	233,567
Salt .....	389,573	414,978	430,835	450,251	474,372
Sewer pipe .....	311,830	357,087	410,064	464,627	600,297
Talc .....	8,700	46,592	47,725	61,358	125,340
Tile, drain .....	363,550	318,456	349,545	279,579	292,767
Total non-metallic produc- tion .....	10,052,879	11,152,217	12,873,930	13,541,869	15,724,376
Add metallic production...	22,928,496	28,161,678	29,102,867	34,799,743	37,507,935
Total production....	32,981,375	39,313,895	41,976,797	48,341,612	53,232,311

As nearly as can be determined, the total value of the metals produced in Ontario since mining in the Province began has now reached the sum of \$263,486,309. Table IV gives the several items. From this amount should be deducted, for the sake of accuracy, the value of domestic iron ore smelted into pig iron in the Province, which will leave the net total in the neighborhood of \$259,000,000. Statistics of the production of platinum, which is not refined in this country, and one or two other metals are incomplete.

Table IV.—Total Production of Metals in Ontario

Product	Value
	\$
Gold.....	9,293,231
Silver .....	113,755,383
Platinum and Palladium .....	290,755
Cobalt .....	1,492,527
Nickel .....	46,263,566
Copper .....	19,080,023
Iron Ore .....	7,148,457
Pig Iron .....	65,965,993
Lead.....	117,290
Zinc Ore .....	92,410

### Gold

The yield of gold last year was 220,837 ounces, valued at \$4,558,518, which was almost equal to the entire production of the Province from the time the first gold was obtained at Madoc in 1866 down to the end of 1912.

There were 16 mines producing bullion, of which seven were in the Porcupine field, as follows: Hollinger, Dome, Porcupine, Acme, Mines Leasing Company (Rea) and Porphyry Hill. The production of the last three was inconsiderable. Three mines at Kirkland and Swastika lakes yielded gold, namely, Tough-Oakes, Swastika, and Lucky Cross. At Larder lake two mines contributed—La Mine D'Or Huronia and Goldfields Limited. There was one each at the following points: Long lake (Canadian Exploration Company), Sturgeon lake (Northern Reef), Atikokan (Elizabeth) and Hastings county (Cordova).

The lion's share of the output was from Porcupine, which furnished no less than \$4,294,113 out of the whole. Here the principal producers were the Hollinger and Dome.

### Hollinger Mine

During the 12 months ending 31st December, 1913, the Hollinger mine milled 138,291 tons of ore, the yield from which was \$2,466,220.24 or \$17.82 per ton. In 1912, 45,195 tons were milled, yielding \$933,682.00 or \$20.65 per ton. The total quantity of ore treated since the mine began operations therefore was 183,486 tons, from which gold was obtained to the value of \$3,399,902.24 or \$18.52 per ton. The value of the ore sent to the stamps last year was \$2,566,414.59, of which all but \$100,436.18 was saved. This represents an extraction of over 96 per cent. There was paid out in dividends in 1913 the sum of \$1,170,000, and carried forward to surplus \$544,214.36, making the total surplus at 31st December, 1913, \$688,462.80, of which \$510,000.00 was in cash and quickly convertible assets. From the total cost of the plant, \$711,975.10, there was written off during the two years the sum of \$211,975.10.

Working costs for the year were as follows per ton of ore milled:

General charges .....	\$ .220
Strike expense .....	.225
Administration and management .....	.332
Taxes .....	.060
Insurance .....	.121
Clearing surface, roads, etc. ....	.028
Operating camps .....	.167
Operating boarding-houses .....	.114
Mining .....	3.089
Milling .....	1.753
	<hr/>
	6.110

Allowing for a small quantity of ore treated for the Acme mine, and adding the equivalent per ton for depreciation of plant, etc., a total working cost is obtained of \$6.975 per ton of ore milled. The operating expenses were considerably enhanced by the miners' strike in the Porcupine camp which began on the 15th November, 1912, and was declared off on 9th June, 1913, the strikers being unsuccessful in resisting a reduction of wages. The capacity of the mill has been increased from 300 to 500 tons of ore per day, and extensions are under way which will further increase the capacity to 650 tons per 24 hours. It is the view of the management that with the increased output the total cost of production and treatment can be gradually decreased to about \$4.50 per ton. During the year \$105,751.56 was expended on buildings and equipment.

Ore was hoisted from the levels at 100, 200, 300 and 425 feet, and a small quantity from below 425 feet. From vein No. 1 there were drawn 70,506 tons, from No. 2, 24,022 tons, and from No. 4, 31,828 tons. The mining work for the year comprised 4,149 feet of drifting at the second levels, 948 feet of cross-cuts, 334 feet of raises, 212 feet of winzes, 368 feet of shaft-sinking, 2,651 feet of diamond-drilling, and 550 feet of trenching.

The ore reserves are placed at 845,300 tons, having a value of \$11,604,800, or an average of \$13.71 per ton. This is an increase of \$1,374,800 as compared with the estimate of a year previous. To No. 1 vein is allotted 284,200 tons, to No. 2 vein 208,400 tons, and to No. 4, 121,100 tons. The average grade of all ore in reserve shown at the beginning of the year was \$17.48 per ton. The falling off to \$13.71 at 31st December is due principally to the fact that the greater part of the year's development was done upon veins of comparatively low value. In average contents the veins in reserve vary from \$7.47 for No. 3 to \$19.56 for No. 1, and \$20.00 for No. 4.

The capital stock of Hollinger Gold Mines, Limited, is \$3,000,000, divided into 600,000 shares of a par value of \$5 each. It owns four mining claims of approximately 40 acres each in the township of Tisdale.

#### Dome Mine

During the year ending 31st March, 1914, there were milled at the Dome mine 145,305 tons of ore, which realized \$1,204,597.64, or a net recovery of \$8.29 per ton. The following were the expenditures: Operating, \$453,965.70; Development, \$161,547.76; Plant and Equipment, \$303,999.02; total, \$919,512.48, leaving a balance of \$287,779.99.

The operating cost, excluding all development charges, was \$3.08 per ton, which represents a decrease as compared with 1912 of \$1.49 per ton. This improvement is attributed to the use of hydro-electric power during most of the year, the larger tonnage milled, increased efficiency of methods and a better supply of labour.

A large amount of development work was done, mostly at No. 2 shaft section, in opening up the third, fourth and fifth levels, east of the "Dome" outcrop, and in further shaft sinking. On the third level a large body of ore was disclosed equivalent to a horizontal area of 100,000 square feet, and defined by 859 feet of drifts and

969 feet of cross-cuts. The average value of this body is estimated at \$3.49 per ton. Immediately below, on the fourth and fifth levels, further areas of ore were located, averaging at the former a value of \$4.03 per ton and at the latter \$4.94 per ton. The amount of development work done figured on the ore milled was equal to \$1.11 per ton.

The balance of fully developed lower grade ore above the 100-foot level is given as 512,600 tons of an average value of \$4.84 per ton, and, in addition, the development work in No. 2 shaft section indicated the existence of 2,000,000 tons of ore, averaging \$3.50 per ton. Diamond drilling has shown other low grade ore bodies to exist, but the data obtained are not sufficiently definite to warrant an estimate of tonnage or values.

The ore sent to the mill came very largely from surface pits, the mine having so far been worked mainly as a quarry, quartz and schist alike being crushed. The total value of the ore treated was \$1,274,598.29, or an average of \$8.77 per ton. The percentage of recovery was 94.51. The bullion obtained by amalgamation amounted in value to \$730,866.79, and by cyanidation \$473,730.85.

In June, 1913, it was decided to increase the capacity to 340,000 tons of ore per year by the addition of 40 stamps, making 80 stamps in all, and to change the process from an all-slime to a combined sand-leaching and slime treatment. Briefly the operations of the enlarged mill may be thus described: The ore, after being delivered from the rock breaker station, will be crushed by 80 stamps and 5 tube mills, the product from the latter being distributed over 24 amalgamating plates, from which one-half the gold will be recovered. The product will then be classified into sands and slimes by means of hydraulic classifying and concentrating cones. The sands will be delivered to six tanks, each 40 feet in diameter by 8 feet 6 inches deep, the extraction of gold from the sands being by means of the leaching of cyanide solution. The slimes will be treated in the existing plant of Pachuca tanks and Merrill slime presses. When the new plant is fully in operation, it is expected to have a favorable influence on working costs, reducing the latter to at least \$2.50 per ton of ore.

The above particulars are in the main abstracted from the company's third annual report. Referring to the mine, the report characterizes it as "a deposit of low grade ore which should be worked by a policy of non-selective mining, and which, on the new basis of treatment, gives assurance of a profitable life."

#### Porcupine Crown

This property, a controlling interest in which is owned by the Crown Reserve Mining Company, Limited, is obtaining satisfactory results. It is situated to the south of and adjoining the Hollinger mine. Five levels were in operation at the close of 1913, at 100, 200, 300, 400 and 500 feet respectively. The mill, which was enlarged during the year from 5 to 15 stamps, treated 19,715 tons of ore of an average value of \$20.30 per ton, the recovery of gold amounting to \$325,542.50.

At the beginning of the year the mill was of 5 stamps only, but 15 stamps were added and the continuous decantation process of cyaniding introduced, increasing the percentage of recovery from 85 to 96 per cent. The reserves of ore are estimated at 72,472 tons, worth \$1,860,227.95, or an average of \$25.66 per ton. The ore shoot is proven to have a length of 600 feet, and diamond drilling has located either a continuation of one ore body, or an altogether new one. In estimating the ore reserves, no allowance is made for any depth below that actually proved by the working faces, nor for any lateral length beyond such proven places. The company expects to treat 35,000 tons of ore during 1914, and is confident of making a profit of \$25,000 per month. As it is without debt, it decided to begin paying a dividend at the rate of 12 per cent. per annum from 1st January, 1914. The Company's capital is \$2,000,000, the par value of the shares being \$1 each.



#### Kirkland Lake

The rich, if small, veins of gold ore found at Kirkland lake brought that field well into view during 1913. The lake itself is about five miles northeast of Swastika station, on the Timiskaming and Northern Ontario Railway, and really lies within the Swastika gold area to the south. The geological characteristics of these areas are described in part two of this report.

The principal property, or at any rate the one upon which the largest amount of development work has been done, is the Tough-Oakes, a group of five claims of about 40 acres each. By the end of the year the shaft was down to 208 feet, and there were two levels, at 100 and 200 feet respectively. Some 247 feet of drifting had been done on the 100-foot level and 146 feet on the 200-foot level. From the narrow veins two shipments of hand-picked ore were made in 1912, and three in 1913, to smelters in Pennsylvania and New Jersey. These shipments comprised in all 101.04 tons of ore, which gave the remarkable return of \$46,221, or \$457.00 per ton. The silver contents ran from 23 to 64 ounces per ton. In addition, 1,975 tons of lower grade ore was put through a 5-stamp mill on the property, from which \$26,232.31 in gold was recovered, or \$13.28 per ton, in addition to \$116.56 worth of silver.

Other groups of claims are known as the Teck-Hughes, Sylvanite, Burnside, Gull Lake, Wright-Hargrave, etc. On the Teck-Hughes in January, 1914, there were three shafts, No. 1 being 120 feet deep, No. 2, 48 feet and No. 3, 80 feet. Nos. 1 and 3 were in the porphyry, No. 2 in the conglomerate. There were 200 feet of drifting and cross-cutting at 100 feet in shaft No. 1, and 205 feet of drifting and cross-cutting in No. 3 at 75 feet.

The Kirkland Lake Proprietary, Limited, formed in London, England, has acquired control of the Tough-Oakes and Teck-Hughes groups, and there was considerable exploitation of the London share market, where stock manipulation is thoroughly understood. The area is certainly a promising one, and if it receives fair treatment from company promoters, its merits will ere long be demonstrated. The veins are found in Timiskaming conglomerate and greywacké in contact with porphyry, and also in the latter. Water power at Long lake on the Blanché river is being developed, and electric current will be transmitted to Kirkland lake for the operation of the mines.

The Lucky Cross and Swastika mines each produced a small quantity of bullion. The mill at the former was increased from 5 to 10 stamps. The original 5 stamps ran about a month and a half, and the completed mill about 35 days.

#### Other Gold Areas

Of the remaining gold mines, the principal producer last year was the Canadian Exploration Company's property at Long lake on the Sault Branch of the Canadian Pacific Railway. This mine, which contains arsenical ore, has been in course of development for some years. The mill now contains 20 stamps, and is equipped with a cyanidation plant. For some time operations were restricted by lack of power, but connection has now been made with the line of the Wahnapiatae Power Company. The plant was in operation for nine months of the year.

In the Larder Lake Mining Division, Goldfields, Limited, carried on some more or less desultory work. The company has developed a water power at Raven falls for the operation of its mine and works. La Mine D'or Huronia, a Three Rivers (Que.) company, have developed a mine near Beaverhouse lake, and have turned out some bullion. It is proposed to operate the mine by a water power on Victoria creek, a short distance away.

At Sturgeon lake, the Northern Reef, or St. Anthony mine, maintains an intermittent existence. It was operated for part of the year only.

In the county of Peterborough, the Cordova mine produced some gold, but was closed down in August. It was reported early in 1914 that new capital had been obtained and that the property was to be re-opened. No other mine in Eastern Ontario reported any production of gold during the year.

The Elizabeth mine, situated  $4\frac{1}{2}$  miles west of Atikokan station on the Canadian Northern Railway, ran a few tons of ore through its mill of 10 stamps. More or less development work was done here, and also at the Canadian Homestake, six miles from Kenora, formerly known as the Scramble mine. The shaft at the latter property was down 200 feet at the close of the year. The mine has an electrical equipment throughout, and derives its power from Kenora.

#### Gold Mining Companies

The gold mining companies reporting to the Bureau for last year are given in the following list, which shows the number of stamps in the several mills, and which were producing and which non-producing concerns:—

#### Gold Mining Companies, 1913

Name of Company.	Name of Mine.	Locality.	No. of Stamps.	P. O. Address of Manager, etc.
<b>Producing Companies:—</b>				
*Acme Gold Mines, Limited. ....	Acme. ....	Porcupine. ....	..	Timmins.
Canadian Exploration Company, Limited. ....	Long Lake. ....	Long Lake. ....	20	Naughton.
Cordova Mines, Limited. ....	Cordova. ....	Peterboro' county. ....	30	Cordova.
Elizabeth Gold Mines, Limited. ....	Elizabeth. ....	Atikokan. ....	10	Atikokan.
†F. C. Preston & W. C. Offer. ....	Porphyry Hill. ....	Porcupine. ....	..	South Porcupine.
Goldfields, Limited. ....	Goldfields. ....	Larder Lake. ....	30	Larder Lake.
Hollinger Gold Mines, Limited. ....	Hollinger. ....	Porcupine. ....	40	Timmins.
La Mine D'Or Huronia, Limited. ....	Huronia. ....	Larder Lake. ....	10	Larder Lake.
Lucky Cross Mines of Swastika, Limited. ....	Lucky Cross. ....	Swastika. ....	10	Swastika.
McIntyre-Porcupine Mines, Limited. ....	McIntyre-Porcupine. ....	Porcupine. ....	10	Schumacher.
Northern Gold Reef, Limited. ....	St. Anthony. ....	Sturgeon Lake. ....	10	Toronto.
Porcupine Crown Mines, Limited. ....	Porcupine-Crown. ....	Porcupine. ....	20	Timmins.
Mines Leasing & Development Company, Limited. ....	Rea. ....	Porcupine. ....	5	Schumacher.
The Dome Mines, Limited. ....	Dome. ....	Porcupine. ....	40	South Porcupine
The Swastika Mining Company, Limited. ....	Swastika. ....	Swastika. ....	5	Confederation Life Building, Toronto.
Tough-Oakes Gold Mines, Limited. ....	Tough-Oakes. ....	Kirkland Lake. ....	5	Swastika.
Total. ....			245	
<b>Non-producing Companies:—</b>				
Canadian Homestake Gold Mining Company, Limited. ....	Canadian Homestake. ....	Kenora. ....	..	Kenora.
Dome Lake Mining & Milling Company, Limited. ....	Dome Lake. ....	Porcupine. ....	..	Schumacher.
Jupiter Mines, Limited. ....	Jupiter. ....	Porcupine. ....	..	Schumacher.
Olympia Gold Mining Company, Limited. ....	Olympia. ....	Shoal Lake. ....	..	92 Reamy Street, St. Paul, Minn.
Pearl Lake Gold Mines, Limited. ....	Pearl Lake. ....	Porcupine. ....	..	Schumacher.
Plenaureum Mines, Limited. ....	Plenaureum. ....	Porcupine. ....	..	Schumacher.
Teck-Hughes Gold Mines, Limited. ....	Teck-Hughes. ....	Kirkland Lake. ....	..	Swastika.
The Gilmour Mining Company, Limited. ....	Gilmour. ....	Hastings county. ....	5	Gilmour.
Three Nations Gold Mining Company. ....	Three Nations. ....	Porcupine. ....	10	Porcupine.
Vipond Porcupine Mines Company, Limited. ....	Vipond. ....	Porcupine. ....	..	Schumacher.

\* Ore treated in Hollinger mill.

† Four tons ore treated in arrastra; 21 tons shipped to smelter at Perth Amboy, N.J.

#### Silver

The mines at Cobalt occupy the same position of supremacy in relation to the output of silver in Ontario as do the Sudbury mines to the production of nickel and copper, and the Porcupine mines to the yield of gold. Ten years have now elapsed since the veins at Cobalt began to be worked, and during these ten years 185 and a half million ounces of silver have been produced, valued at 98 and a quarter million dollars. This means that the total weight of pure silver yielded by the mines up to 31st December, 1913, was 6,360 tons of 2,000 pounds each; or in other words, allowing 313 working days to a year, 2 tons of pure silver have been taken out of the mines of Cobalt for every working day since they began to produce.

The production for 1913 was 29,681,975 ounces, which is 561,884 ounces less than in 1912, or a decrease of 1.85 per cent. This falling off is in itself not a serious matter, but last year was the second year in succession to show a diminution as compared with its predecessor, and it may now be concluded that the climax of production has been passed, and that henceforth a smaller yield may year by year be looked for. High-water mark was reached in 1911, when the output was 31,507,791 ounces. Compared with the yield of 1911, that for 1913 shows a diminution of 5.79 per cent. To obtain the total production of silver in the Province, it is necessary to add to the quantity above given the silver accompanying the bullion obtained from the gold mines. This amounted to 42,956 ounces, making the entire yield of silver 29,724,931 ounces.

The mines of Cobalt proper of course furnish the great bulk of the output, the lesser Cobalts so far not having been relatively important contributors. Apportioning to each source its share of the product, the following figures show the origin of the silver:—

	Ounces.
Cobalt proper .....	28,105,505
Casey township .....	825,108
Gowganda . . . . .	502,370
South Lorrain .....	248,992
Gold mines .....	42,956
Total .....	29,724,931

The number of producing mines in 1913 was 35, as against 34 in 1912. The following list gives the names of those whose production exceeded 1,000,000 ounces:—

Nipissing . . . . .	4,844,169
Coniagas . . . . .	3,252,566
La Rose . . . . .	2,592,775
Cobalt Townsite .....	2,314,602
McKinley-Darragh-Savage . . . . .	2,228,497
Kerr Lake . . . . .	2,072,407
Crown Reserve .....	1,776,678
Buffalo . . . . .	1,752,199
O'Brien . . . . .	1,240,931
Seneca-Superior . . . . .	1,124,577

The only new name on this list is that of Seneca-Superior, which takes the place of Cobalt Lake. There are, however, some changes in the order of precedence as compared with 1912, when the list contained eleven names. The three leaders in 1912 were again at the head last year, and in the same order, but Cobalt Townsite moved up to fourth place, Crown Reserve dropped from fourth place to seventh, and O'Brien, which was eleventh in 1912, became ninth in 1913.

The following mines yielded less than a million, but more than half a million ounces:—

Cobalt Lake .....	980,858
Casey-Cobalt .....	825,108
Timiskaming . . . . .	768,939
Beaver Consolidated .....	726,801
Trethewey . . . . .	599,036
Hudson Bay .....	544,823

The other producing mines were Aladdin Cobalt, Bailey Cobalt, Chambers-Ferland, City of Cobalt, Cobalt Comet, Cochrane, Colonial, Drummond, Hargrave, Lumsden, Orion Realty, Penn-Canadian, Gould, Right-of-Way, Silver Bar, York-Ontario, Mann, Miller Lake-O'Brien, Wettlaufer-Lorrain.

In the outlying camps the productive mines were:—In Casey township, Casey-Cobalt; in Gowganda, Miller Lake-O'Brien and Mann; in South Lorrain, Wettlaufer-Lorrain.

#### Shipments

There were shipped from the Cobalt district last year 9,861 tons of ore and 11,016 tons of concentrates, a total tonnage of 20,877. The shipments in 1912 comprised 10,719 tons of ore and 11,214 tons of concentrates, total 21,933 tons. As has been pointed out on previous occasions, the natural evolution of camp practice is in the direction of carrying the treatment of ore to the highest profitable point. Thus, the Nipissing Company, which has led the way in ore processes at Cobalt, by means of its high grade and low grade ore mills, brings practically all the product of its mines to the form of merchantable bars, which are shipped direct to London. It purchases considerable quantities of ore from other mines, and ships the result also as refined bars. The total production of bullion in the Nipissing mills was 6,530,871 ounces, of which 4,726,994 ounces were the product of Nipissing ores, and 1,803,877 ounces the product of ore received from other mines. Similarly, the Buffalo mine, which has also a mill for treating high grade ore and concentrates, sent almost the entire output of its mine to market in the form of bullion. The total product of the Buffalo last year was 1,752,199 ounces, of which only 83,436 ounces were marketed in concentrates, the remainder, 1,668,763 ounces, being converted into bullion. One result of the tendency above noted is of course to restrict bulk shipments of untreated material. The reduction works connected with the Coniagas and O'Brien mines, though situated at Thorold and Deloro respectively, are really part of the equipment of Cobalt camp, and were they located within its limits the consignments by railway would be still further curtailed, since they treat a large part of the high grade output both as ore and concentrates.

The silver contents of the shipments were as follows:—

Product.	Quantity.	Silver.
	(tons)	(ounces)
Ore . . . . .	9,861	13,668,079
Concentrates . . . . .	11,016	8,489,321
Bullion . . . . .	.....	7,524,575

#### Concentration of Ore

The remarkably rich ore which characterized the Cobalt deposits when they were opened and during the early stages of their operation, is by no means as yet exhausted. Old veins continue to be worked, and new ones are found from time to time both on the surface and by exploration underground. Notable instances of recent date were the rich vein found by the Seneca-Superior Company while prospecting their ground under the bed of Cart Lake, leased from the Peterson Lake Company, and the spectacular outcrops disclosed on the Kerr Lake property on draining the lake.

Notwithstanding this persistence of high grade ore, it is being recognized that the future of the camp depends largely upon the lower grades of material. These are principally of two kinds. One is composed of small stringers of ore of ordinary type, occurring in sufficient abundance in a given area to render the whole workable. The other is wall rock, into the cracks and fissures of which native silver in thin films and plates has passed from the main veins.

Concentration of low grade ore is now part of the established practice at Cobalt, and practically all the mines of importance either have concentrating plants of their own or arrange with one or other of the custom works at Cobalt for treatment of their low grade. The latter practice is not confined to the poorer classes of ore. The Nipissing high grade mill treated 632 tons of high grade ore last year from some half



dozen mines which found it more convenient or profitable to dispose of their ore in this way than to ship it out of the camp.

The quantity of low grade ore concentrated during the year was 470,377 tons, the resulting concentrates weighing 11,268 tons, the average ratio of concentration being therefore 42.5 to 1. This quantity does not include the material treated in the Nipissing and Buffalo low grade mills or the Dominion Reduction Works, where the concentrate product was converted into bullion, but comprises only the ores treated at the various mines and works, the product of which was shipped out of the camp as concentrates to be treated elsewhere. The actual shipments of concentrates amounted to 11,016 tons, containing 8,489,321 ounces of silver, an average of 770.6 ounces per ton. Applying this average to the whole production, it would appear that the silver content of the 11,268 tons would be 8,683,120 ounces.

The low grade ores refined into silver bullion at the Nipissing, Buffalo and Dominion Reduction Company's works, amounted to 204,151 tons, yielding 5,127,043 ounces of silver, an average of 25.1 ounces per ton.

A complete statement of the low grade ores manipulated in the various concentrating and refining plants of the Cobalt camp last year would therefore be as follows:—

	Ore treated. (tons)	Product. (tons concen- trates)	Silver. (ounces)
At mines and custom works ..	470,377	11,268	8,683,120
Refining works, Cobalt .....	204,151	Bullion.	5,127,043
Total . . . . .	674,528	.....	13,810,163

The average recovery per ton of ore treated by the mines and custom works was 18.45 ounces, and by the bullion plants 25.11 ounces, or for the whole quantity treated, 20.47 ounces. If it is assumed that as much as 85 per cent. of the original silver was recovered, which is perhaps an over-estimate, the silver contained in the rock when it went to the mills amounted to 16,011,956 ounces, or an average per ton of 24.08 ounces.

The above of course takes no account of the low grade ore shipped to smelters in the United States where, because of its silicious qualities, it is found useful for making furnace mixtures with basic ores. The figures, however, make quite evident the very important part in the Cobalt silver mines which the low grade ores and milling rock have already come to play. It is likely that this importance will increase, rather than diminish, with the progress of the camp.

One effect, already quite noticeable, will be the rise in the demand for labour in proportion to the output of silver. It requires a much larger number of men to get out large quantities of low grade ore than comparatively small quantities of high grade material, and a larger number of hands to treat and manipulate the ores. More machinery and more power are also necessary, involving the expenditure of more capital in fixed investments.

#### Silver Smelters

The principal smelting works in operation during the year were those of the Nipissing Mining Company, the Buffalo Mines, Limited, the Dominion Reduction Company, the Deloro Mining & Reduction Company, and the Coniagas Reduction Company. The first two are situated on the property of the respective companies at Cobalt, and are operated in connection with the mines. At the Nipissing mill is also purchased high grade ore from other mines. The quantity of such material bought by the Nipissing Company last year was 632 tons, averaging 2,854 ounces of silver per ton. All this was converted into bullion along with 1,200 tons of high grade ore from the

Nipissing mine itself, averaging 2,501 ounces per ton. The total quantity of bullion shipped from the plant being 6,530,871 fine ounces, which includes also the product of the low grade mill, namely, 1,985,209 ounces recovered from 77,240 tons.

The Coniagas works are at Thorold, and handle chiefly the high grade ores and concentrates produced at the Coniagas mine. At Deloro in Hastings county, the Deloro Mining & Reduction Company treat the high grade ores and concentrates from the O'Brien mine, and also similar material brought from other mines at Cobalt.

The Canada Smelting & Refining Company's plant, situated at Orillia, was consumed by fire and was in consequence not in operation during the year.

The Metals Chemical Company, Welland, Dominion Refineries, North Bay, and Buffalo and Ontario Smelting & Refining Company, Kingston, all erected plants of limited capacity, but have not as yet taken an important part in the refining of silver or treatment of Cobalt ores. The Dominion Refineries went into liquidation, and the property is now owned by the Standard Smelting & Refining Company.

#### Markets and Prices

Viewing the world as a whole, both the output and the price of silver were lower in 1913 than in 1912. The estimate of last year's production by the Director of the United States Mint is 212 million ounces, as compared with 224 million ounces in 1912, and 229 million ounces in 1911. The result is arrived at, however, after crediting Canada with a yield of 38,500,000 ounces, which is certainly an excessive estimate, exceeding the true figures by about 5,500,000 ounces. Making this reduction, the world's production would be in the neighborhood of 206 and a half million ounces. The principal falling off was in Mexico, where mining, in common with all other industries, suffered by the internecine strife which prevailed during the year, and still obtains. The yield of silver in that country is given as 68,050,000 ounces, as against 71,250,000 ounces in 1912 and 75,032,400 ounces in 1911. It speaks well for the intrinsic merits of the silver mines of Mexico when the prevalence of what from the outside looks like anarchy is compatible with so comparatively slight a reduction in the output.

The United States increased its yield from 60,339,400 ounces in 1911 to 63,766,000 in 1912, and 67,601,111 ounces in 1913, thus closely approaching the output of Mexico, hitherto the most important producer. The increase is due largely to an enlarged production by the silver-lead mines of Idaho and Colorado and the silver-gold mines of Nevada. The output of Canada as a whole was about a million ounces more than in 1912.

The other principal important sources of silver are Australia and South America, the former of whom shows a reduction as compared with 1912 of 2,900,000 ounces, and the latter 5,280,000 ounces. Other countries, including Spain, Germany, Japan, Central America and Africa share in the decrease, which seems to have been general throughout all the silver-producing communities of the world, except some of the leading silver camps in the United States.

The course of prices for silver in 1913 was not such as to stimulate production, the average price for fine silver in New York being 59.782 cents per ounce, as compared with 60.837 cents in 1912. In January the price rose to 62.9 cents, fell in February to 61.6 cents, and in March to 57.9 cents; advanced in April to 59.5 cents, and in May to 60.4 cents, receding in June to 59 cents, and in July to 58.7. August saw a rise to 59.3 cents, September to 60.6 cents, and October to 60.8 cents. The price fell again in November to 59 cents, and in December to 57.8 cents.

The demand for silver was less active in 1913 than usual.

Exports from London to India amounted to £9,850,000, as compared with £12,390,641, of which about £5,500,000 was taken by the Indian Government for coinage into rupees in anticipation of moving the excellent crops ensured by favorable monsoons. The ineradicable tendency of the Indian speculators to gamble on the rise and fall of the

market led to consequences disastrous to a number of the native banks, the principal of which, the Indian Specie Bank, was obliged to close its doors in November. This institution was committed to the purchase of about £3,000,000 of silver in London, but a strong syndicate was formed in the latter place to take over the whole amount, which action had the effect of restoring the market to more normal conditions. The tendency in India, noted in recent years, to favor gold rather than the time-honored silver for hoarding purposes, was more marked than ever last year. Over £9,500,000 worth of 10-ounce gold bars were forwarded from London to India last year, as compared with £8,124,000 in 1912.

China is another important mart for silver, but the large purchases which have for some time been looked for by the government of that country in order to reform the system of currency have not yet been made. Although China is now nominally a republic, the recently-elected President, Yuan Shi Kai, is apparently not disposed to be trammelled by a useless and expensive Parliament, and has consequently dismissed the latter. What effect this will have upon the scheme of financial renovation, or the many other reforms which have been proposed in that country, time alone will show. Stocks of sycee and bar silver in Shanghai were much larger at the close of 1913 than a year before, having a value of £5,785,000, as against £3,347,000.

What the course of prices for silver may be in the near future no one can predict. In view of the slackening of production, especially in Mexico, and of the shrinkage of stocks on hand at the close of the year to unusually small dimensions, it would seem probable that at any rate no further lowering of values is imminent.

In table V subjoined are presented the statistics of the yearly and total output of silver from the Cobalt mines since the beginning of production in 1904.

Table V.—Silver Production, Cobalt Mines, 1904 to 1913

Year.	Producing Mines.	Shipments.			Silver Contents.			Av'ge Silver Contents per Ton.	Value of Silver Shipments.			Total	
		Ore,	Con- cen- trates	Bullion,	Ore.	Concen- trates,	Bullion,		Ore.	Concen- trates,	Bullion,	Ounces.	Value.
		Tons.	Tons.	oz.	oz.	oz.	oz.		\$	\$	\$		\$
No.													
1904	4	158			206,875			1,399	111,887			206,875	111,887
1905	16	2,144			2,451,356			1,143	1,360,503			2,451,356	1,360,503
1906	17	5,335			5,401,766			1,013	3,667,551			5,401,766	3,667,551
1907	28	14,788			10,023,311			677	6,155,391			10,023,311	6,155,391
1908	30	24,487	1,137		18,022,480	1,415,395		736	8,468,293	665,085		19,437,875	9,133,378
1909	31	27,729	2,948		22,436,355	3,461,470		809	1,174	10,809,872	1,651,704	25,897,825	12,461,576
1910	41	27,437	6,845		980,633	22,581,714	7,082,834	821	1,030	11,360,499	3,590,098	30,645,181	15,478,047
1911	34	17,278	9,375		3,132,976	20,318,626	8,056,189	1,176	858	10,250,991	4,017,241	31,507,791	15,953,847
1912	30	10,719	11,214		5,080,127	15,395,504	9,768,228	1,436	871	8,766,871	5,556,919	30,243,859	17,408,935
1913	35	9,861	11,016		7,524,575	13,668,079	8,489,321	1,386	770	7,444,995	4,554,797	29,681,975	16,553,981
1904-1913	..	139,936	42,535	16,718,311	130,506,066	38,273,437	16,718,311	932	900	68,396,843	20,035,844	185,497,814	98,285,096

#### The Subsidiary Constituents

Since the operators of the silver mines at Cobalt get little or nothing for the cobalt, nickel and arsenic contained in the ores or concentrates which they sell to the smelting companies, practically no record is kept of the quantities produced of these substances.

On the basis of the data set out in the Twentieth Report of the Bureau, pages 17 and 18, it is assumed that the ores and concentrates as shipped from Cobalt contain on the average 3.20 per cent. of cobalt, 1.47 per cent. of nickel, and 14.28 per cent. of arsenic. Figuring in the concentrate equivalent of the low grade ores refined to the bullion stage at Cobalt, together with the actual consignments of ore and concentrates, a theoretical production is obtained for 1913 of 821 tons of cobalt, 377 tons of nickel, and 3,663 tons of arsenic. Statistics are obtained from the refining companies which account for the quantities of these several substances recovered in treat-



ing the ores and concentrates passed through their plants, but no such information can be had with respect to the consignments of ore and concentrates exported to other countries. In consequence, it is impossible to say what proportion of the cobalt, nickel and arsenic contained in the year's production of ore from the mines of Cobalt eventually finds utilization in the arts, though it is doubtless considerable.

Under these circumstances, in compiling the tables of production, the estimated quantities of these substances are given, and in the valuation column the amount of money actually received by the mine operators and refiners—chiefly the latter—when the products are marketed. For this reason it would be misleading to divide the value by the quantity of any one of these products and to assume that the result would be the average price at which the whole was sold. As a matter of fact, probably a considerable percentage may not have been sold at all, the amount of money shown in the value column simply representing the return obtained for that portion actually sold. It seems desirable, however, to make the record as complete as possible, so that an idea may be obtained not only of the gross value of the output of the Cobalt mines, but also of the potentialities of these valuable elements produced in such profusion and as yet only in part utilized.

Table VI, which follows, gives the gross production of the various metals at Cobalt since the opening of the mines.

Table VI.—Total Production, Cobalt Mines, 1904 to 1913

Year.	Nickel.		Cobalt.		Arsenic.		Silver.		Total Value.
	Tons.	Value.	Tons.	Value.	Tons.	Value.	Ounces.	Value.	
		\$		\$		\$		\$	\$
1904....	14	3,467	16	19,960	72	903	206,875	111,887	136,217
1905....	75	10,000	118	100,000	549	2,693	2,451,356	1,360,503	1,473,196
1906....	160	.....	321	80,704	1,440	15,858	5,401,766	3,667,551	3,764,113
1907....	370	1,174	739	104,426	2,958	40,104	10,023,311	6,155,391	6,301,095
1908....	612	.....	1,224	111,118	3,672	40,373	19,437,875	9,133,378	9,284,869
1909....	766	.....	1,533	94,965	4,294	61,039	25,897,825	12,461,576	12,617,580
1910....	504	.....	1,098	54,699	4,897	70,709	30,645,181	15,478,047	15,603,455
1911....	392	.....	852	170,890	3,806	74,609	31,507,791	15,953,847	16,199,346
1912....	429	14,220	934	314,381	4,166	80,546	30,243,859	17,408,935	17,818,082
1913....	377	13,326	821	420,386	3,663	64,146	29,681,975	16,553,981	17,051,839
Total.	3,700	42,187	7,656	1,471,529	29,517	450,980	185,497,814	98,285,096	100,249,792

#### Profits and Dividends

From table VII, it will be seen that the amount of the dividends declared by the Cobalt silver mines in 1913 was \$9,104,984. This is somewhat less than the amount in 1912, which was \$9,324,049. The total dividends declared by these mines to the end of 1913 amount to \$50,362,130. Table VI shows that the total value of the output of these mines since the beginning of operations in 1904 to the end of 1913 amounted to \$100,249,792. Hence the dividends have been equal to over 50 per cent. of the total output. In addition to dividends declared and paid, profits made by private owners amount to about five million dollars.

The dividends paid by Porcupine gold mines increased from \$270,000 in 1912, to \$1,170,000 in 1913.



Table VII—Statement of Dividends and Bonuses Declared to December 31st, 1913.  
By Cobalt Silver Mines and Porcupine Gold Mines.

Name of Company.	Date of Incorporation.	Authorized Capital.	Capital issued.	Par value per share.	Amount of Dividends and Bonuses declared to end of 1912.	Amount of Dividends and Bonuses declared during 1913.	Total of Dividends and Bonuses declared to Dec. 31, 1913.	Last Dividend or Bonus in 1913.	Rate per cent.
Beaver Consolidated Mines, Limited.....	Feb. 25, 1907.....	2,000,000	2,000,000	1.00	330,000 00	60,000 00	410,000 00	Nov. 29, 1913.....	3
Buffalo Mines, Limited.....	April 27, 1906....	1,000,000	1,000,000	1.00	1,877,000 00	810,000 00	2,687,000 00	Dec. 6, 1913.....	18
Cassy Cobalt Mining Company, Limited.....	Dec. 19, 1906....	100,000	100,000	1.00	109,499 32	109,499 32	209,998 64	Oct. 8, 1913.....	109.5
City of Cobalt Mining Company, Limited.....	{ Oct. 5, 1906, .. { Jan. 7, 1909, ..	500,000 } 1,500,000 }	5,000,000	1.00	115,000 00	.....	115,000 00	April 15, 1909, ..	3
Cobalt Central Mines Company.....	Dec. 13, 1906....	5,000,000	5,000,000	1.00	192,845 00	27,000 00	219,845 00	Aug. 25, 1909....	1
Cobalt Comet Mines, Limited.....	Apr. 16, 1913....	1,000,000	1,000,000	5.00	75,000 00	.....	75,000 00	Nov. 19, 1913....	2.1
Cobalt Lake Mining Company, Limited.....	Dec. 22, 1906....	4,070,834	3,925,165	1.00	315,000 00	210,000 00	525,000 00	Nov. 25, 1913....	32
Cobalt Silver Queen, Limited.....	April 1, 1906....	1,500,000	1,500,000	1.00	315,000 00	.....	315,000 00	Dec. 31, 1908....	3
Cobalt Townsite Mining Co., Limited.....	May 6, 1906....	100,000	45,011	1.00	171,000 00	371,168 87	542,168 87	Nov. 11, 1913....	.....
Comstock Mines, Limited.....	Nov. 21, 1906....	4,000,000	4,000,000	5.00	1,280,000 00	1,640,000 00	2,920,000 00	Nov. 1, 1913....	14
Crown Reserve Mining Company, Limited.....	Jan. 16, 1907....	2,000,000	1,999,957	1.00	1,775,737 80	735,968 30	2,511,706 10	Dec. 8, 1913....	2
Foster Cobalt Mining Company, Limited.....	Feb. 14, 1906....	1,000,000	915,588	1.00	45,000 00	.....	45,000 00	Jan. 1, 1907....	5
Kerr Lake Mining Company, Limited.....	Aug. 9, 1905....	40,000	40,000	100.00	1,610,000 00	610,000 00	2,220,000 00	Oct. 14, 1913....	385
La Rose Mines, Limited.....	Feb. 21, 1907....	6,000,000	6,000,000	5.00	3,652,516 84	951,000 00	4,603,516 84	Dec. 12, 1913....	5.65
McKinley-Barraclough-Savage Mines of Cobalt, Limited.	April 9, 1906....	2,500,000	2,247,692	1.00	3,280,628 28	719,261 11	3,999,889 39	Nov. 11, 1913....	6
Nipissing Mining Company, Limited.....	Dec. 16, 1904....	250,000	250,000	100.00	1,830,000 00	.....	1,830,000 00	Dec. 15, 1913....	182
The Right of Way Mines, Limited.....	{ Sept. 11, 1909, .. { July 13, 1909, ..	2,000,000 } 500,000 }	1,685,500	1.00	292,360 00	.....	292,360 00	Dec. 2, 1911....	2
Seneca Superior Silver Mines Limited.....	Sept. 30, 1911....	500,000	478,884	1.00	221,643 93	310,274 60	531,918 53	Nov. 7, 1913....	123
Temiskaming and Hudson Bay Mining Company, Limited.....	July 29, 1903....	25,000	7,761	1.00	1,707,420 00	162,981 00	1,870,401 00	Dec. 22, 1913....	300
The Hudson Bay Mines, Limited.....	July 16, 1909....	3,500,000	3,200,050	5.00	586,006 42	192,083 00	778,089 42	Aug. 31, 1913....	22
Temiskaming Mining Company, Limited.....	{ Jan. 1, 1908, .. { Nov. 16, 1908, ..	2,500,000 } 2,500,000 }	2,500,000	1.00	1,309,156 25	75,000 00	1,384,156 25	Dec. 31, 1913....	3
Tretheway Silver Cobalt Mine, Limited.....	{ May 30, 1906, .. { June 1, 1911, ..	1,000,000 } 2,000,000 }	1,000,000	1.00	1,861,998 50	150,000 00	2,011,998 50	Dec. 1, 1913....	5
Wetherau-Lorrain Silver Mines, Limited.....	Nov. 30, 1908....	1,500,000	1,416,590	1.00	566,626 00	70,829 50	637,455 50	Sept. 22, 1913....	5
Hollinger Gold Mines, Limited.....	June 28, 1910....	3,000,000	3,000,000	5.00	260,000 00	1,170,000 00	1,430,000 00	Dec. 31, 1913....	3
Total.....	.....	.....	.....	.....	40,087,146 35	10,274,984 04	50,362,130 41	.....	.....

\* An error was made in the Dividend return for 1913. The first Dividend for 1913 being included.

† Less profit to original owners.

‡ This amount (\$361,998.50) declared in 1912. \$861,998.50 paid in that year. The latter figures are those used in the 22nd Report and have been retained here on that account.

In the following notes are given summaries of the annual reports of a few of the most important companies operating in the Cobalt district. The printed reports summarized are those for the calendar year 1913, or the latest company year, as the case may be.

#### Nipissing

The total production of silver was 4,552,173 ounces, of which about 40 per cent. was from low-grade ore. In addition to this \$62,000 was realized from the sale of cobalt residues. Hitherto the percentage derived from high-grade ore was much greater. Total cost of recovery of silver was 24.09c. per oz.; average price received, 60.26c. Total silver production to end of 1913, 32,585,417 ounces.

#### Coniagas

The figures for this company are for the year ending 31st October, 1913. The rich ore and concentrates from the mill are shipped to the Coniagas Reduction works at Thorold.

The total amount of silver produced was 3,380,846 ounces, about two-thirds of this being from rich shipping ore. The average of the 736 tons of mine ore shipped was 3,057 ounces per ton.

The total production to the end of October, 1913, was 17,662,904 ounces.

#### Seneca-Superior

This company leased a portion of the holdings of the Peterson Lake Mining Company under Peterson lake. The discovery of a very valuable vein by the Seneca-Superior is one of the most important recent events in the history of the Cobalt district. Substantial production started in the beginning of 1913.

The production for the year was 1,174,000 ounces.

#### Crown Reserve

The total production for the year was 1,776,676 ounces, of which approximately 65 per cent. was from high-grade ore and 6 per cent. from metallics or bullion contained in the high-grade, the balance being from milling ore shipped to the Dominion Reduction Company.

The total production to end of 1913 was 17,003,821 ounces.

#### Kerr Lake

For the company year ending 31st August, 1913, the total production was 2,109,975 ounces, of this about 25 per cent. was derived from milling ore treated by the Dominion Reduction Company.

The total cost of production per ounce is given as 21.39 cents.

#### Cobalt Townsite

The report is for the eleven months ending 30th September, 1913. The total production was 1,987,921 ounces, of this about 21 per cent. was from milling ore and the balance from high-grade.

#### La Rose

The total production, including that from the Lawson and Princess, for the year was 2,592,775 ounces, of this nearly 75 per cent. was from high-grade ore, the Princess being the heaviest producer. The cost of production was 22.8 cents per oz. The total production to the end of 1913 was 20,420,064 ounces.

#### McKinley-Darragh Savage

The total silver production for the year was 2,214,036 ounces, about three-quarters of this coming from the McKinley mine. Only about 21 per cent. of the silver from the McKinley is obtained from high-grade ore and nuggets, while with the Savage mine more than half is from this source. The total costs per oz. were 22.33 cents.

The total production to the end of 1913 was 12,863,479 ounces; of this the McKinley has yielded 10,587,513.

### Silver Producing Companies, 1913

Name of Company or Owner.	Name of Mine.	Locality.	P. O. Address of Manager, etc.
Aladdin Cobalt Company, Limited	Silver Queen	Cobalt	Cobalt.
Bailey Cobalt Mines, Limited	Bailey	Cobalt	Giroux Lake.
Beaver Consolidated Mines, Limited	Beaver	Cobalt	Cobalt.
Buffalo Mines, Limited, The	Buffalo	Cobalt	Cobalt.
Casey Cobalt Silver Mining Company, Limited	Casey-Cobalt	Casey Township.	New Liskeard.
Chambers-Ferland Mining Company, Limited	Chambers-Ferland	Cobalt	Cobalt.
City of Cobalt Mining Company, Limited	City of Cobalt	Cobalt	Cobalt.
Cobalt Comet Mines, Limited	Drummond	Cobalt	Giroux Lake.
Cobalt Lake Mining Company, Limited	Cobalt Lake	Cobalt	Cobalt.
Cobalt Townsite Mining Company, Limited	Townsite	Cobalt	Cobalt.
Cochrane Mines of Cobalt, Limited	Cochrane	Cobalt	Haileybury.
Colonial Mining Company, Limited	Colonial	Cobalt	Cobalt.
Coniagas Mines, Limited, The	Coniagas	Cobalt	Cobalt.
Crown Reserve Mining Company, Limited	Crown Reserve	Cobalt	Cobalt.
East Dome Mines, Limited	Silver Bar, under option	Cobalt	Cobalt.
Hargrave Silver Mines, Limited, The	Hargrave	Cobalt	Giroux Lake.
Hudson Bay Mines, Limited, The	Hudson Bay	Cobalt	New Liskeard.
Kerr Lake Mining Company, Limited	Kerr Lake	Cobalt	Cobalt.
La Rose Mines, Limited	La Rose	Cobalt	Cobalt.
Lumsden Mining Company, Limited, The	Lumsden	Cobalt	Cobalt.
Mann Mines	Mann	Gowganda	Gowganda.
McKinley-Darragh-Savage Mines of Cobalt, Limited	McKinley-Darragh and Savage	Cobalt	Cobalt.
Millerett Silver Mining Company, Limited	Millerett	Gowganda	Gowganda.
Nipissing Mining Company, Limited	Nipissing	Cobalt	Cobalt.
O'Brien, M. J.	O'Brien	Cobalt	Cobalt.
O'Brien, M. J.	Miller Lake-O'Brien	Gowganda	Gowganda.
Penn-Canadian Mines, Limited	Penn-Canadian	Cobalt	Cobalt.
Porcupine Syndicate & Gould Consolidated	Gould	Cobalt	Cobalt.
Right-of-Way Mines, Limited, The	Right-of-Way	Cobalt	Cobalt.
Seneca-Superior Silver Mines, Limited	Seneca-Superior	Cobalt	Cobalt.
Temiskaming Mining Company, Limited	Temiskaming	Cobalt	Cobalt.
Trethewey Silver Cobalt Mine, Limited	Trethewey	Cobalt	Cobalt.
Wettlaufer-Lorrain Silver Mines, Limited	Wettlaufer-Lorrain	Lorrain Tp.	Silver Centre.
York-Ontario Silver Mines, Limited	York-Ontario	Cobalt	Cobalt.
Non-Producing.			
Caleta Silver Mines, Limited	Location L357-358	Gowganda	Gowganda.
Canadian Gold and Silver Mining Company	Provincial	Cobalt	Giroux Lake.
Cobalt Provincial Mining Company, Limited	Downey	Mickle Tp.	North Bay.
Downey Property			
Associated Gold Mines of Western Australia, Limited	Keeley	South Lorrain	Haileybury.
Peterson Lake Silver Cobalt Mining Company, Limited	Peterson Lake	Cobalt	Cobalt.

### The Market for Cobalt

This is one metal the actual consumption of which has probably decreased, contrary to the enormous expansion in the use of practically all other metals. Friedrich Kapff's work, published in 1792, which gives a report on all the works making cobalt blue at that time in Germany, has been alluded to in previous reports of the Bureau (Vol. XIX, Part 2). From this it would appear that the works outside of Holland made about 3,000 tons of cobalt blue yearly. If the Holland works were added the total quantity would probably be 4,000 to 5,000 tons yearly of the blue color. This contained from 3 to 15 per cent. cobalt, the amounts of the high percentage material not being so great as the lower. Probably the average of the whole would have been 6 or 7 per cent. At the time the Cobalt district was discovered the total consumption of cobalt for the world likely did not equal 300 tons yearly of the metal. From the table given below it will be seen that the refiners of Ontario cobalt ores produced cobalt oxide which contained 216.8 tons of the metal. In addition to this 357 tons of cobalt ore and cobalt-bearing residues were shipped for which the owners received \$23,473. This would probably increase the total metal from Ontario ores by about 30 tons.

### Bounties on Cobalt and Nickel

Under the Metal Refining Act, Chap. 33, R.S.O. 1914, a bounty of 6 cents per lb. metal in cobalt or nickel oxide or metal is paid on such product as is refined in the Province. This bounty expires in 1917. The following amounts were paid for oxides produced in 1913:—

Name of Company.	Location.	Metal in Cobalt Oxide	Metal in Nickel Oxide	Bounty
		lb.	lb.	\$
Coniagas Reduction Co., .....	St. Catharines...	325,811	149,645	28,527.36
Deloro Mining and Reduction Co., ....	Deloro.....	104,574	.....	6,274.44
Standard Smelting and Refining Co.,	North Bay.....	3,582	.....	214.92
Total.....	.....	433,967	149,645	35,016.72

### Nickel

An overwhelming proportion of the nickel supply of Ontario is obtained at present from the Sudbury district, the Alexo mine accounting for only 0.06 per cent. of the output. The output of the Sudbury mines was 780,101 tons, and was distributed as follows:—

	Tons.
Creighton mine .....	418,525
Crean Hill mine .....	56,646
No. 2 mine .....	56,439
No. 3 mine (Frood) .....	86,665
Garson mine .....	113,403
Victoria No. 1 .....	38,592
North Star .....	11,294
Worthington .....	537
	780,101
Alexo mine .....	4,596
Total . . .	784,697

The amount of ore smelted was somewhat greater, viz.: 823,403 tons; more was taken from the roast heaps than was put into them during the year.

The metal content and value of the ore smelted are given in Table VIII.

### Progress of Nickel Mining

The progress can best be seen by reference to Table VIII, which gives the statistics for the years 1909 to 1913, and shows that the ore production rose from 452,000 to 785,000 in round numbers during that period. Both of the companies operating have extended and practically rebuilt their works, the Mond Nickel Company having removed all their smelting operations from Victoria Mines, about twenty miles west of Sudbury, to Coniston, about nine miles east.



## Copper

The total copper production of Ontario was 12,941 tons, all of which, except three tons, coming from the copper-nickel mines of Sudbury and the Alexo mine in Dundonald township. The three tons mentioned were contained in the concentrate from the Temiskaming mine at Cobalt.

The 47,150 tons matte produced at Sudbury contained 37,760 tons nickel and copper combined, or 80 per cent. approximately of metal. Calculating from the 823,403 tons ore smelted, with no allowances for loss, this gives 3.02 per cent. nickel and 1.57 per cent. copper, or approximately 2 to 1.

The increased production in nickel and copper is shown by the following table:—

Table No. VIII.—Nickel-Copper Mining, 1909 to 1913.

Schedule.	1909	1910	1911	1912	1913
Ore raised.....tons	451,892	652,392	612,511	737,656	784,697
Ore smelted.....“	462,336	628,947	610,788	725,065	823,403
Bessemer matte produced.....“	25,845	35,033	32,607	41,925	47,150
Nickel contents.....“	13,141	18,636	17,049	22,421	24,838
Copper contents.....“	7,873	9,630	8,966	11,116	12,938
Value of Nickel.....\$	2,790,798	4,005,961	3,664,474	4,722,040	5,237,477
Value of Copper.....\$	1,122,219	1,374,103	1,281,118	1,581,062	1,839,438
Wages paid.....\$	1,234,904	1,698,184	1,830,526	2,357,889	3,291,956
Men employed.....No.	1,796	2,156	2,439	2,850	3,512

The nickel mining concerns carrying on active work are:—

Name of Company.	Name of Mine.	Location.	P.O. Address of Manager, etc.
Canadian Copper Company.....	Creighton, Crean Hill, No. 2, etc.	Sudbury.....	Copper Cliff
Mond Nickel Company, Limited	Victoria, Garson .....	“ .....	Coniston
E. F. Pullen.....	Alexo .....	Dundonald Tp...	Cochrane

## Platinum and Palladium

The Sudbury ores in some cases contain very small quantities of the precious metals, including platinum and palladium. The last Report of the Bureau showed that in six years, 1907 to 1912 inclusive, the average production per year of the matte treated by the Orford refining works had amounted to 394 oz. platinum and 702 oz. palladium. The value of both these metals is over \$40 per oz.

## Iron Ore

Four companies shipped ore during the year; the names appear in the list below. A certain amount of roasted ore was shipped from the Magpie mine at Michipicoten. The ore is a siderite impregnated with some pyrite; when roasted it produces material of an excellent quality. This ore contains a little manganese. The Moose Mountain mine at Sellwood, north of Sudbury, shipped a few thousand tons of briquettes made from slimes produced by wet magnetic concentration. All of the ore at this mine is of such a grade that it must first be concentrated. A small amount of the total production was from Hastings county.

The total ore production was 195,937 tons, with value of \$424,072. Of this approximately 90,000 tons were exported.

The following is a list of companies operating:—

### Iron Mining Companies, 1913

Name of Company.	Name of Mine.	Locality.	P. O. Address of Manager, etc.
Producing Companies:—			
Algoma Steel Corporation, Limited. ....	Helen .....	Michipicoten ....	Helen Mine.
Buffalo Union Furnace Company .....	Magpie .....	Michipicoten ....	Magpie Mine.
Canada Iron Mines, Limited .....	Belmont .....	Hastings county. 51	Hamburg Street,
	Childs .....	Hastings county.	Buffalo, N.Y.
Moose Mountain, Limited .....	Bessemer .....	Sudbury Dist. ...	Trenton.
	Moose Mountain .....	Sudbury Dist. ...	Sellwood.
Non-producing Company:—			
Atikokan Iron Company Limited .....	Atikokan .....	Port Arthur Dist.	Port Arthur.

### Pig Iron and Steel

In 1913 there were ten blast furnaces in operation in Ontario, which had an output of 648,899 tons. The number of employees at the blast furnaces only was 1,014. Of the total pig iron made 16,470 tons were charcoal iron. To produce this quantity of pig iron 1,228,269 tons of ore and 25,817 tons scale and mill cinder were used. The table below gives all the details of materials used and output for the last five years. It shows a steady increase in the steel output.

Table IX.—Production Iron and Steel, 1909 to 1913

Schedule.	1909	1910	1911	1912	1913
Ontario ore smelted.....tons	220,307	143,284	67,631	71,589	132,708
Foreign ore smelted.....“	543,544	678,890	848,814	1,062,071	1,095,561
Limestone for flux.....“	226,991	248,750	275,628	305,509	351,741
Coke .....	436,707	471,493	577,388	660,248	706,852
Charcoal .....	973,413	1,133,419	1,666,897	1,886,748	2,206,191
Pig iron .....	407,013	447,351	526,610	589,593	648,899
Value of pig iron.....\$	6,301,528	6,975,418	7,716,314	8,054,369	8,719,892
Steel .....	296,031	331,321	361,581	457,817	648,948
Value of steel.....\$	6,759,960	7,855,407	9,505,013	8,071,339	11,230,109

The following companies were producers of pig iron in 1913:—

Name of Company.	No. of Furnaces.	Fuel.	Location.
Canada Furnace Co.....	1	Coke .....	Midland.
Algoma Steel Corporation.....	3	“ .....	Sault Ste. Marie.
Steel Company of Canada .....	2	“ .....	Hamilton
Standard Iron Co.....	1	Charcoal ..	Deseronto.
“ .....	1	“ .....	Parry Sound.
Canada Iron Corporation.....	2	Coke .....	Midland.

## Materials of Construction

Nearly all the materials used in construction showed an increase over 1912. Common brick is the most important; in amount it was 386,882 M and in value \$3,283,894. Paving and fancy brick were 18,547 M in amount and \$243,119 in value. Pressed brick showed a substantial increase in output, being 76,138 M, worth \$871,291. Sand-lime brick had a value of \$459,699. Sewer pipe to the value of \$600,297 was made, and 14,265,000 drain tiles worth \$251,705. Building stone, including crushed stone for road metal, totalled \$1,117,153 in value. Lime amounting to 2,300,991 bushels, with a value of \$390,600, was made. As shown in a following page, there was an increase in the production of Portland cement. Returns received show that sand and gravel to the value of \$233,567 were produced during the year.

Following are lists of clay-working plants, lime manufacturers, and stone quarries:

## List of Clay-Working Plants

Name.	Address.	Manufacture.
Adamson, William	Walkerton	Tile.
Allen, Solomon	Brantford	Brick.
Alsip Brick & Tile Co.	Fort William	Brick.
Armstrong, George H.	Brigden	Hollow Blocks and Tile.
Arnold, Willard	Pefferlaw	Brick.
Ashbridge Brick Co.	Toronto	Brick.
*Baeckler, William	Chesley	Brick.
Baird & Son, H. C.	Parkhill	Brick and Tile.
Baker, George E.	Arnprior	Terra Cotta, Brick and Tile.
Baker Bros.	Casselman	Brick.
Bartonville Pressed Brick Company, Limited	Bartonville	Pressed Brick.
†Beaverton Clay Products Co.	Beaverton	Brick.
Beckett, E. C.	Orwell	Brick and Tile.
Bell, John H.	Harriston	Brick.
Bell Bros.	Drew	Tile.
Bell Bros.	Paisley	Brick and Tile.
Bell Bros. & Co.	Toronto	Brick.
Belleville Pottery Co.	Belleville	Pottery.
Bemrose, Thos.	Beeton	Brick and Tile.
†Big Four Brick Company, Limited	Toronto	Brick.
*Blake, Elias D.	Elginfield	Brick.
*Blake, W. C.	Nairn	Brick.
Bogart Bros.	Southwold	Tile.
Bond & Bird	Woodstock	Brick.
Boone, George H.	Thornbury	Brick.
Bowler, Wes.	Markdale	Brick.
Brampton Pressed Brick Company, Limited	Brampton	Pressed Brick.
Brandon Pressed Brick & Tile Co., Limited	Milton	Pressed Brick.
Brantford Brick Co., Limited	Brantford	Brick.
Broadwell, Benj.	Kingsville	Brick and Tile.
Brown, J. W.	Vienna	Tile.
Brown Bros. Brick Co.	Mount Dennis	Brick.
Brownscombe & Sons, H.	Cargill	Brick and Tile.
*Buchanan Bros. & Co.	Thessalon	Brick.
Buck, J. L.	Port Rowan	Brick and Tile.
Burgess, C. F.	Carleton Place	Brick.
Bushell, William	Toronto	Brick.
Butwell Brick Co.	Humber Bay	Brick.
Cabana, Jr., Oliver	St. Joseph	Brick and Tile.
Cairo Brick & Tile Works	Cairo	Brick and Tile.
Campbell, Neil F.	West Lorne	Brick and Tile.
†Canada Brick & Fire Proofing Co., Limited	Terra Cotta	Brick.
Card, N. B.	Harrisburg	Brick and Tile.

## List of Clay-Working Plants—Continued

Name.	Address.	Manufacture.
*Caswell, Edgar .....	Cobden .....	Brick and Tile.
Clemens, Moses .....	Thamesville .....	Brick and Tile
Conway, F. P. ....	Stratford .....	Brick and Tile
Cooper, W. H. ....	Ancaster Tp., Hamilton	Brick.
Cornhill & Son, James .....	Chatham .....	Brick.
Cranston & Son, J. ....	Hamilton .....	Pottery.
Crawford Bros. ....	Hamilton .....	Brick.
*Credit Forks Brick & Tile Co. ....	Toronto .....	Brick and Tile.
Crowhurst, W. J. ....	Port Hope .....	Brick.
Cumberland, J. M. ....	Listowel .....	Tile.
Curtis Bros. ....	Peterboro' .....	Brick and Tile
Davenport, B. F. ....	Orwell .....	Brick and Tile
Davis & Son, John .....	Toronto .....	Pottery.
Deller & Sons, Geo. ....	Norwich .....	Brick and Tile
Deller Bros. ....	Thorndale .....	Tile.
Dodge, Geo. ....	Kerrwood .....	Tile.
Dominion Brick & Tile Company, Limited .....	Breslau .....	Brick.
Dominion Sewer Pipe Co., Limited ..	Waterdown Sta. ....	Brick.
Dominion Sewer Pipe Co., Limited ..	Swansea .....	Sewer Pipe.
Don Valley Brick Works .....	Todmorden .....	Common Brick, Pressed and Fancy Brick, Terra Cotta, etc.
*Dryden Timber & Power Co., Limited	Dryden .....	Brick.
Dublin Brick & Tile Works .....	Dublin .....	Brick and Tile
*Dunlop & Schmidt .....	Pembroke .....	Brick.
Elliott, William .....	Glenannan .....	Brick and Tile
*Emard, Trefflé .....	Embrun .....	Brick.
*Farah, K. ....	New Liskeard .....	Brick.
Forman, Stephen .....	St. Mary's .....	Hollow Blocks and Tile.
Foley Consolidated Brick & Tile Co., The F. J. ....	West Toronto .....	Brick and Tile
Foster Pottery Co. ....	Hamilton .....	Pottery.
Fox, G. J. ....	Dresden .....	Brick.
Frank, C. D. ....	Strathroy .....	Brick.
Frazer & Logan .....	Blyth .....	Brick and Tile
Freek, William .....	Barrie .....	Brick.
Frid Brick Co., Geo. ....	Hamilton .....	Brick.
Frid Bros. ....	Hamilton .....	Brick.
Frost, Geo. H. ....	Toronto .....	Brick.
Fuller, Geo. ....	Dracon .....	Brick and Tile
Gardiner, William .....	Blenheim .....	Tile.
Govenlock, J. M. ....	Winthrop .....	Brick and Tile
Gowanlock, J. ....	West Fort William ..	Brick.
Hall, Mrs. Henry .....	Cooourg .....	Brick.
Hallett, H. ....	Comber .....	Brick and Tile
Hallman, J. B. ....	Hanover .....	Brick.
Halton Brick Co., Limited .....	Tp. of Esquesing ....	Pressed Brick.
Hamilton and Toronto Sewer Pipe Company, Limited .....	Hamilton .....	Sewer Pipe.
Hamilton Pressed Brick Co., Limited	Hamilton .....	Pressed Brick.
Hamley, R. H. ....	Bowmanville .....	Brick and Tile
Hancock, William .....	Hamilton .....	Brick.
Hicks, David .....	Shelburne .....	Tile.
Hill & Sons, James S. ....	Madoc .....	Brick.
Hill Bros. ....	Essex .....	Brick and Tile
Hinde Bros. ....	West Toronto .....	Brick.
Hiscock & Sons .....	Cobourg .....	Brick.
Hitch, John .....	Ridgetown .....	Brick and Tile
Hohl, Geo. ....	Lisbon .....	Brick and Tile
Holton Bros. ....	Drew .....	Brick.
Howlett, Fred. ....	Petrolea .....	Brick and Tile.
Humberstone, Thos. Allan .....	Newton Brook .....	Pottery.
Irwin, W. J. ....	Proton Sta. ....	Brick and Tile.
*James, Wm. ....	Blackwell .....	Brick.
Jamieson, J. A. ....	Renfrew .....	Brick and Tile.



## List of Clay-Working Plants -Continued

Name.	Address.	Manufacture.
Janes, H. ....	Delaware .....	Brick and Tile.
Jervis & Son, John .....	Dorchester Sta. ....	Brick and Tile.
Johnson, James .....	Pembroke .....	Brick.
Johnston, Joseph .....	West Monkton .....	Brick and Tile.
Jordan, Daniel .....	Chatham .....	Brick and Tile.
Kaar, John .....	Brownsville .....	Tile.
Kerr, Fred. ....	Crediton East .....	Brick and Tile.
Koebel, Joseph Z. ....	St. Clement's .....	Brick and Tile.
Kruse Bros. ....	Egmondville .....	Brick and Tile.
Kuhn, Henry J. ....	Crediton East .....	Tile.
*Lang Bros. ....	Merrickville .....	Brick.
Launders, Thos. ....	Fruitland .....	Brick.
Leamington Brick & Tile Co., Limited .....	Leamington .....	Brick and Tile.
Leatherdale, R. W. ....	Dresden .....	Tile.
Lethbridge, W. W. ....	Steelton .....	Brick.
*Lichty, J. B. ....	Wellesley .....	Brick.
Light, William .....	Aylmer .....	Brick and Tile.
Lindsay, Stephen .....	Tupperville .....	Tile.
Lines, J. C. ....	Earlscourt .....	Brick.
Lingham, W. T. ....	Belleville .....	Brick.
Logan, John .....	Toronto .....	Brick.
Lowe, Gordon .....	Kent Centre .....	Brick and Tile.
Mackay Bros. ....	Dutton .....	Brick and Tile.
Marshall, W. W. ....	Hamilton .....	Brick.
Martin, David .....	Thamesville .....	Brick and Tile.
Mason, Charles .....	Toronto .....	Brick.
*Mawhinney, Robt. ....	Lovat .....	Brick.
Meaford Brick Co., Limited .....	Meaford .....	Brick.
Merkley Bros. ....	Casselman .....	Brick.
Maloney, John .....	Humber Bay .....	Brick.
Mills, Geo. E. ....	Hamilton .....	Brick.
Milton Pressed Brick & Sewer Pipe Co., Limited .....	Milton .....	Pressed Brick.
Miner, J. T. ....	Kingsville .....	Brick and Tile.
Moody, G. W. ....	Highgate .....	Brick and Tile.
*Montoux Bros. ....	Topping .....	Brick.
Morley, Walker .....	Toronto .....	Brick.
Morley & Ashbridge .....	Toronto .....	Brick.
*Mouldey, John .....	Bath Road .....	Brick.
Mullinex, W. C. ....	Hepworth .....	Brick.
Munro, D. W. ....	Carp .....	Brick and Tile.
*Murray, Timothy .....	Gad's Hill .....	Brick.
McCormick Bros. ....	Kingscourt .....	Brick and Tile.
McCracken Corporation, Limited .....	Windsor .....	Brick and Tile.
McCredie, W. ....	Lyons .....	Brick and Tile.
*McDonald & Reasbeck .....	Plantagenet .....	Brick.
McGibbon, Dugald .....	Shedden .....	Brick and Tile.
McLean Bros. ....	Brigden .....	Tile.
McLoughlin, John .....	London .....	Brick.
Napanee Brick & Tile Co., Limited .....	Napanee .....	Brick.
National Fire Proofing Co. of Canada, Limited .....	Waterdown .....	Terra Cotta, Hollow Tile, Fire-proofing.
Nayler & Son, J. W. ....	Trenton .....	Brick.
New, Edward .....	Hamilton .....	Brick.
Norton, Alsey .....	Bolton .....	Brick and Tile.
Norton, David .....	Woodbridge .....	Tile.
Norton, T. W. ....	West Toronto .....	Brick.
Oakville Pressed Brick Co. ....	Oakville .....	Brick and Tile.
Ollmann Bros. ....	Hamilton .....	Brick.
Ontario National Brick Co., Limited .....	Cooksville .....	Shale Brick.
Ontario Paving Brick Co., Limited .....	West Toronto .....	Paving Bricks and Blocks.
Ontario Sewer Pipe Co., Limited .....	Mimico .....	Sewer Pipe.
O'Reilly, T. E. ....	Ottawa .....	Brick.
Ott Brick & Tile Co., Limited .....	Berlin .....	Brick.

## List of Clay-Working Plants—Continued

Name.	Address.	Manufacture.
Ottawa Brick Manufacturing Co., Limited	Ottawa	Brick.
Owen Sound Brick Co., Limited	Owen Sound	Brick.
*Paisley & Chisholm	Kingston	Brick.
Parks, H. W.	Dresden	Tile.
Paxton & Bray	St. Catharines	Brick.
Pears & Son, James	Toronto	Brick.
Pears, William	West Toronto	Brick.
Peerless Brick & Tile Co., Limited	Ottawa	Brick.
Pembroke Brick Co., The	Pembroke	Brick.
Petty, Chas.	Cherrywood	Brick and Tile.
Phillips, Thos.	St. Helen's	Tile.
Phinn, Geo. E.	Elginfield	Brick and Tile.
Pilon, A.	Casselman	Brick.
Piper, Murphy & Walsh	West Fort William	Brick.
Ponsford, A. E.	St. Thomas	Brick and Tile.
Port Credit Brick Co., Limited	Port Credit	Common Brick and Pressed Brick.
Port Dover Brick & Tile Co.	Port Dover	Brick and Tile.
Price, John	Toronto	Brick.
Prices, Limited	Toronto	Brick.
Reed, Mrs. A.	Foxboro	Tile.
Richardson & Son, James	Kerrwood	Brick and Tile.
Ries, John	Carlsruhe	Brick and Tile.
Rilett, David	Oil Springs	Tile.
Rilett & Holme	Alvinston	Brick and Tile.
Robinet Brick Co., Limited	Sandwich	Brick.
Russell, Joseph	Toronto	Brick.
*Russell Brick & Tile Co., Limited	Russell	Brick and Tile.
Ryan & Co., T. M.	Niagara Falls	Brick.
Schaefer Brick Co., Limited	New Hamburg	Brick and Tile.
Scott, James M.	Meaford	Brick and Tile.
*Shuttleworth & Co.	Petrolia	Brick.
Sinden, L. H.	Tillsonburg	Brick and Tile.
Sipprell, J. H.	Wilksport	Brick and Tile.
Smith, Allan G. C.	Acton	Cement Blocks and Tile.
Smith & Son, Alex.	Dutton	Brick and Tile.
Smith, W. W.	Shallow Lake	Brick and Tile.
Smith Bros.	Port Elgin	Brick.
Snelgrove & Teers	Beaverton	Brick and Tile.
Souter & Co., G. S.	Seaforth	Brick and Tile.
Sproat, Wm. M.	Toronto	Brick.
Standard Brick Co., Limited	North Bay	Brick.
Steele, Edwin	Vankleek Hill	Brick.
Stickwood, Chas.	Newmarket	Brick.
Sudbury Brick Co., Limited	Sudbury	Brick.
Stratford Brick, Tile & Lumber Co.	Stratford	Brick and Tile.
Stroh, Henry	Wallenstein	Tile.
Sun Brick Co., Limited	Toronto	Brick.
Superior Brick Co., Limited	Fort William	Brick.
Surridge, F.	West Toronto	Brick.
Taylor Bros.	Kemptville	Brick.
Taylor, James	Port Hope	Pottery.
Taylor & Hall	Peterboro'	Brick, Tile and Culvert Pipe.
Terra Cotta Pressed Brick Co., Limited	Terra Cotta	Pressed Brick.
Thornton, John	Perth	Brick.
Toronto Pressed Brick & Terra Cotta of Milton, Limited	Milton	Pressed Brick.
Turnbull, Robt.	Wellsand	Brick.
Voakes, Ed. R.	Wheatley	Brick and Tile.
Wagstaff, A. H.	Toronto	Brick.
Waide Bros.	London	Brick.
Waite, J. E.	Forester's Falls	Brick and Tile.

## List of Clay-Working Plants—Concluded

Name.	Address.	Manufacture.
Wallace & Son, R. ....	North Bay .....	Brick.
Wardle, John .....	Blenheim .....	Brick and Tile.
Waterloo Brick & Tile Co., Limited ..	Waterloo .....	Brick.
Watson Brick Co. ....	Bracebridge .....	Brick.
*Watterworth, Chas. ....	Wardsville .....	Brick and Tile.
Wehlann & Son .....	Rodney .....	Brick and Tile.
Weppler, Henry .....	Hanover .....	Brick and Tile.
*West Bros. ....	Campbellford .....	Brick and Tile.
*Wiser & Sons, Limited, J. P. ....	Prescott .....	Brick.
Woods, W. H. ....	Brockville .....	Brick.
Workman, James .....	Hamilton .....	Brick.
Wright, Samuel .....	Chesley .....	Brick and Tile.
Wright Bros. ....	Kincardine .....	Brick and Tile.
Yaeck, Louis .....	Walkerton .....	Brick.

\*Not working in 1913.

†No return from them.

‡In course of construction.

## List of Sand-lime Brick Manufacturers

Name.	Address.
Canada Sand-lime Pressed Brick Co., Limited ....	West Toronto.
Harbour Brick Company, Limited .....	Toronto.
John Mann Brick Company, Limited. ....	Brantford.
Port Arthur Sand-lime Brick Co., Limited. ....	Port Arthur.
Schultz Bros. Company, Limited. ....	Brantford.
Silicate Brick Company of Ottawa, Limited. ....	Ottawa.
Toronto Brick Company, Limited .....	Toronto.
Willcox Lake Brick Company, Limited. ....	Willcox Lake.
York Sandstone Brick Company, Limited. ....	East Toronto.

Total production of sand-lime brick for 1913 was 53,072 thousand, worth \$459,699.25.

The brick plants of Toronto and immediate vicinity produced 220,356 thousand brick, worth \$2,034,974, of which 36,670,000 were sand-lime brick, having a value of \$313,259; 28,540 thousand, with a value of \$355,756, were pressed and fancy brick, terra cotta, etc., and 4,642 thousand, valued at \$79,931, were paving brick.

## Lime Producers

Name of Owner or Company.	Location.
*Alex. Alexander .....	Alton.
Geo. Annis .....	Orillia.
*Albert Appleyard .....	Georgetown.
M. A. Ball .....	Jordan.
Beachville White Lime Company, Limited. ....	Beachville.
Patrick Bergin .....	Napanee.
Geo. Brown .....	Cataraqui.
E. A. Brown (Oliver) .....	Owen Sound.
John Callan & Bros. ....	Innerkip.
W. M. Cameron .....	Carleton Place.
Canada Lime Co., Limited .....	Coboconk.
David Chalmers .....	Owen Sound.
Delta Lime Company, Limited .....	Delta.
J. H. Duckett .....	Eugenia.
E. & F. Elieler .....	Clarendon Tp.
*Wm. Foote .....	Varna.
*Wm. Foster .....	Cheltenham.
E. Harvey, Limited .....	Rockwood.
*J. Hebert .....	Casselman.
Higginson & Stevens .....	Stepney.

## Lime Producers—Continued

Name of Owner or Company	Location
Jamieson Lime Company .....	Renfrew.
*J. M. Jelly .....	Bowling Green.
*Kingston Penitentiary .....	Kingston.
J. Langman .....	Hawkestone.
Alfred Lavoie .....	St. Felix.
*Alfred Leslie .....	Puslinch.
G. D. Lumsden .....	Holstein.
J. MacTernan .....	Woodlawn.
*J. Marren .....	St. Andrews.
J. Marshall .....	Hamilton.
Jas. McGillivray .....	Durham.
Fred. McMillan .....	Havelock.
Peter Milton .....	Campbellford.
John Montgomery .....	L'Amable.
James Moore .....	Foxmead.
*J. Muldoon & Company .....	Toronto.
*Oneida Lime Company .....	Hamilton.
*Ontario Limestone and Clay Co., Limited.....	Shannonville.
*R. T. Parks .....	Troy.
Emerie Poirier .....	Apple Hill.
*T. A. Poole .....	Perth.
*John Quigley .....	Pakenham.
John A. Reeb .....	Port Colborne.
D. Robertson Company, Limited .....	Milton.
H. Robillard & Son .....	Ottawa.
J. S. Smith .....	Inverhuron.
*W. J. Smith .....	Beaverton.
Standard Chemical, Iron and Lumber Co.....	Eganville.
Standard White Lime Company, Limited .....	St. Mary's.
The Toronto Lime Company, Limited .....	Limehouse.
Albert Wellman, Sr. ....	Bellevue.

\*Idle in 1913.

## Stone Quarries

Name of Owner, Firm or Company.	Location.	Kind of Stone.
Ball, M. A. ....	Jordan.....	Limestone.
Bergin, Patrick .....	Napanee.....	do
Britnell & Company, Limited.....	Burnt River.....	do
Callan & Bros., John .....	Innerkip.....	do
Canada Crushed Stone Corporation, Limited.	Dundas.....	do
Canada Iron Corporation, Limited .....	Longford.....	do
Cartmell, Wm. ....	Thorold.....	do
Cook, J. S. ....	Warton.....	do
Coughlin, Daniel .....	Smith's Falls.....	do
*Credit Forks Brick and Tile Company.....	Toronto.....	
Empire Limestone Company .....	Sherkston.....	Limestone.
Farr, C. C. ....	Haileybury.....	do
Fleming, J. H. ....	Glenwilliams.....	Sandstone.
Fretz, Jacob M. ....	Vineland.....	Limestone.
Gallagher Lime and Stone Co., Limited.....	Hamilton.....	do
Gordon & Bruce .....	Lyndhurst.....	Granite.
Granite Crushed and Dimension, Limited ...	Washago.....	do
Hagersville Contracting Co., Limited.....	Hagersville.....	Limestone.
Hagersville Crushed Stone Company .....	Hagersville.....	do
Hamilton Works Department .....	Hamilton.....	do
Harrison & Beatty .....	Owen Sound.....	do (rubble).
Hastings Quarries, Limited .....	Actinolite.....	Granite.
Howey, Geo. ....	Nanticoke.....	Limestone.
Inter-Cities Quarries Company .....	Port Arthur.....	Trap Rock.



## Stone Quarries—Continued

Name of Owner, Firm or Company	Location	Kind of Stone
*Kennedy, R. C. ....	Guelph.....	Limestone.
Kingston Penitentiary .....	Portsmouth.....	do
Longford Quarry Company, Limited .....	Longford Mills.....	do
Maloney, John .....	Puslinch.....	do
Markus & Company .....	Pembroke.....	do
Marshall, James .....	Hamilton.....	do
Murphy, J. S. ....	Tweed.....	do
Oliver & Webster .....	Owen Sound.....	do
Ontario Rock Company, Limited.....	404 Lumsden Build- ing, Toronto ....	Trap Rock.
Perkins, G. A. ....	Owen Sound.....	do
Point Anne Quarries, Limited .....	Point Anne.....	do
Power City Stone Company, Limited .....	Niagara Falls .....	do
Queenston Quarry Company, Limited .....	St. David's.....	do
Reeb, John A. ....	Port Colborne.....	do
Robertson, D., & Company, Limited.....	Milton.....	do
Robillard & Sons, H. ....	Ottawa.....	do
Roddy & Monk .....	Kingston.....	do
Rogers, F., & Company .....	Terra Cotta.....	Sandstone.
St. Mary's Horse Shoe Quarry.....	St. Mary's.....	Limestone.
*T. Sidney Kirby Company, Limited.....	Ottawa.....	Sandstone and Limestone.
Thames Quarry Company, Limited .....	St. Mary's.....	Limestone.
Thibeault, Adelard .....	Carleton.....	do
Thunder Bay Contracting Company, Limited .....	Port Arthur.....	Trap Rock.
*Tietz, Wm. A. ....	Waterford.....	Limestone.
Tweed Quarries, Limited .....	Tweed.....	Granite.
Webb, Geo. F. ....	Hamilton.....	Limestone.
*Webster, James S. ....	Galt.....	do
*Welk, Herman .....	Eganville.....	do
Wentworth Quarry Company, Limited .....	Vinemount .....	do
Wilson, G. S. ....	Manion.....	Sandstone.

\*Idle in 1913.

## Marble and Granite Quarries

Name of Owner, Firm or Company.	Kind of Stone.	Address.
Bannerman & Horne .....	Granite.....	126 Polson Avenue, Winnipeg, Man.
*Canadian Marble Company, Limited .....		16 Toronto St., Toronto.
*Central Ontario Marble & Granite Quarries..		Trenton.
Ontario Marble Quarries, Limited.....	Marble.....	34 Price St., Toronto.

\*Idle in 1913.

## Sand and Gravel

Name of Owner, Firm or Company.	Location of Deposit.	P.O. Address of Manager, etc.
Armstrong Supply Company, Limited .....	York St., Hamilton.	
Barnes, Wm.....	Stoney Creek .....	105 Dalhousie St., Hamilton.
Bartonville Gravel Pit .....	Bartonville .....	Brantford.
*Battle, John .....	near Port Maitland.	Thorold.
*Buchanan, John Alexander .....	Point Pelee .....	Windsor.
Canada Pebble Company, Limited.....	Jackfish .....	Port Arthur.
Clifton Sand and Gravel Company.....	Stamford .....	St. Catharines.
Empire Limestone Company .....	Sherkston .....	Buffalo, N.Y.
Fineout, Geo. H. ....	Black Bar, Lamb Island, etc. ....	Port Arthur.
*Fraser, John .....	Tp. of Malden .....	Amherstburg.
*Grubb, William A. ....	Leamington .....	Leamington.
Hagerman, Anson V. ....	Fellows .....	Fellows.
Hansen, Hans Christian.....	Pele Island .....	7325 Clinton Ave., Cleveland, Ohio.
Kingston Sand and Gravel Company.....	Tp. of Kingston ...	Kingston.
New, Edward .....	York St., Hamilton.	133 George Street, Hamilton.
Ollmann Bros. ....	Between Macklin St. and Paradise Rd., Hamilton .....	Hamilton.
Penhorwood, Sydney Lewis.....	Sault Ste. Marie....	Sault Ste. Marie.
Smith & Company, Home .....	Jane St., West To- ronto .....	Lambton Mills.
Todd, Eldoras .....	Bartonville .....	336 Main St. East, Hamilton.
Webb, M. M. ....	Burlington Heights.	Hamilton.
York Sand and Gravel Company.....	Scarboro, York Co.	Toronto.

\*Not operating in 1913.

## Portland Cement

This product showed an increase of about 800,000 barrels over the previous year, and was 3,802,321 barrels, with value of \$4,105,455. Most of it is now made from limestone instead of from marl, as formerly.

## Portland Cement Plants

Name of Company.	Location of Plant.	P.O. Address of Manager, etc.
*Ben Allen Portland Cement Co., Limited.....	Benallen .....	R.R. No. 7, Owen Sound.
Canada Cement Company, Limited, Plant No. 4.	near Belleville .....	Herald Bldg., Montreal, Que.
do do do No. 5.	near Belleville .....	do do
do do do No. 6.	near Marlbank .....	do do
do do do No. 7.	near Lakefield.....	do do
do do do No. 8.	near Port Colborne.	do do
do do do No. 9.	near Shallow Lake.	do do
The Hanover Portland Cement Co., Limited....	Hanover .....	Hanover.
The Imperial Cement Company, Limited.....	Owen Sound .....	Owen Sound.
Maple Leaf Portland Cement Co., Limited....	Atwood .....	Listowel.
National Portland Cement Co., Limited.....	Durham .....	Durham.
The Ontario Portland Cement Co., Limited....	Blue Lake .....	Brantford.
St. Mary's Portland Cement Co., Limited.....	St. Mary's .....	St. Mary's.
Superior Portland Cement Co., Limited.....	Orangeville .....	Box 134, Orange- ville.

\*In course of construction.

## Other Minerals and Mineral Products

## Arsenic

All the arsenic produced during the year was a by-product from the silver-bearing ores of the Cobalt district. In all 2,450,758 pounds, with a value of \$64,146, were made and shipped, the average price being about 2.6 cents per lb.

## Refineries of Cobalt-Silver Ore

## (Producers of White Arsenic)

Name of Company.	P.O. Address of Manager, etc.
The Coniagas Reduction Company, Limited.....	St. Catharines.
The Deloro Mining and Reduction Company, Limited.....	Deloro.
Dominion Refineries, Limited .....	North Bay.
Metals Chemical Company, Limited.....	Welland.

The amount of pyrites mined and shipped in 1913 was 71,620 tons, with a value of \$171,687. This is somewhat greater than for the previous year.

Of the producers given below, the Nichols Chemical Company have an acid works and make acid at the mine.

The following were the producers for 1913:

## Iron Pyrite Producers, 1913

Name of Owner, Firm or Company.	Location or name of Mine	P.O. Address of Manager, etc.
Algoma Steel Corporation, Limited .....	Helen .....	Sault Ste. Marie.
Canadian Sulphur Ore Company, Limited...	Queensboro .....	404 Lumsden Building, Toronto.
Nichols Chemical Company, Limited .....	Sulphide .....	Sulphide.
Northern Pyrites Company .....	Vermilion Lake ....	Northpines.
Sulphide Chemical Company, Limited .....	Sulphide .....	Sulphide.

## Gypsum

The gypsum is obtained in the vicinity of Caledonia, Haldimand county. The production for the year was 40,581 tons, valued at over \$92,000, as against \$50,000 for the previous year.

## Gypsum Mines

Name of Owner, Firm or Company	Location of Mines	P.O. Address of Manager, etc.
The Alabastine Company of Paris, Limited.	Caledonia .....	Paris.
Crown Gypsum Company, Limited.....	Lythmore .....	Lythmore.
*William Smith .....	Caledonia .....	Caledonia.

\*Not producing in 1913.

## Salt

The salt production shows little change from year to year. It is all derived from wells near Lakes Huron and St. Clair. The yield for 1913 was 96,799 tons, valued at \$474,372, being a slight increase over the previous year.

The salt producers are given below:—

## Salt Companies

Name of Owner, Firm or Company.	Location of wells or works.	P.O. Address of manager, etc.
The Canadian Salt Company, Limited....	Windsor .....	Windsor.
*Carter & Kittermaster .....	Sandwich .....	175 Christina St. S., Sarnia.
The Dominion Salt Company, Limited....	Mooretown .....	Sarnia.
The Elarton Salt Works Company, Limited.	Sarnia .....	Sarnia.
Exeter Salt Works Company, Limited....	South of Egremont Road .....	Hyde Park.
The Gray, Young & Sparling Company of Ontario, Limited .....	Exeter .....	Exeter.
Ontario People's Salt & Soda Co., Limited..	Wingham .....	Wingham.
John Ransford .....	Kincardine .....	Kincardine.
Western Canada Flour Mills Co., Limited..	Stapleton .....	Clinton.
The Western Salt Company, Limited....	Goderich .....	Goderich.
	Mooretown and Courtright.....	Courtright.

\*Not producing in 1913.

## Calcium Carbide

All the production came from the works of the Canadian Carbide Company, Merritton, the output being 2,052 tons.

## Corundum

The output was 1,177 tons, with a value of \$137,036. The address of the only operating company is given below:

Name of Company.	Location of mines	P.O. address of manager, etc.
Manufacturers Corundum Co., Limited.....	Carlow Tp. and Craigmont .....	712 Traders Bank Building, Toronto.

## Feldspar

The output of this mineral shows a substantial increase both in amount and value, the figures being 18,615 tons, with a value of \$73,338. During the year a factory for the manufacture of floor tiles was erected at Kingston. Ground feldspar is used as one of the ingredients of the tile.

The producers of feldspar are:

## Feldspar Mines

Name of Owner, Firm or Company	Location of mine	P.O. address of manager, etc.
Dominion Feldspar, Limited .....	Parham .....	30 Adelaide St. W., Toronto.
Dominion Improvement & Development Co..	N. Burgess Tp. ....	Box 26, Perth.
Charles Jenkins .....	Bedford Tp. ....	Petrolia.
Kingston Feldspar and Mining Company....	Desert and Reynold mines .....	Kingston.
McDonald Feldspar Company, Limited.....	Verona .....	720 Traders Bank Toronto.
Ojaipsee Company, Limited .....	Parry Sound .....	375 Spadina Ave., Toronto.



## Graphite

This mineral also shows an increase, the amount of refined graphite being 1,788 tons, with a value of \$93,054.

## Graphite Properties

Name of Owner, Firm or Company.	Location of mines or works.	P.O. address of manager, etc.
J. G. Allan .....		211 Bay St. South, Hamilton.
Black Donald Graphite Company, Limited..	Whitefish lake ....	Calabogie.
The Globe Refining Company, Limited .....	N. Elmsley Tp. ....	175 Cooper Street, Ottawa.
Tonkin du Pont Graphite Co., Limited.....	Wilberforce .....	Wilberforce.

## Quartz

By far the greater part of the quartz mined is used by the Canadian Copper Company as a flux in their nickel-copper smelting operations, but a smaller quantity, together with quartzite, is used in other plants. The total production for the year was 54,320 tons, with value of \$130,860.

## Quartz Producers

Name of Owner, Firm or Company.	Location of mines	P.O. address of manager, etc.
The Canadian Copper Company .....	Dill .....	42 Exchange Place, New York.
The McPhail & Wright Construction Co., Ltd	Mile 19, A. C. Ry....	Sault Ste. Marie.
The Mond Nickel Company, Limited .....	Neelon Tp. ....	Coniston.
A. B. Willmott .....	Killarney .....	404 Lumsden Bldg., Toronto.

## Talc

The production of this mineral shows a marked increase both in quantity and value, the amount being 17,988 tons, worth \$100,480. As the qualities of Ontario talc become better known the market is widened.

## List of Talc Producers in Ontario, 1913

Name of Firm or Company	Location of mine or works	Address of manager, etc.
Cross & Wellington .....	Huntington Tp. ....	Madoc.
Canadian Talc and Silica Company .....	Eldorado .....	Eldorado.
Geo. H. Gillespie Company, Limited .....	Madoc .....	Madoc.

## Peat Fuel

Only 1,500 tons were produced during the year, all in the Shuttleworth plant.

## Peat Plants

Name of Firm or Company	Location of plant	P.O. address of manager, etc.
J. McWilliam .....	Dorchester Tp. ....	402 Dundas Street, London.
J. M. Shuttleworth .....	Alfred .....	Peterboro.

## Mica

The mica production for the year was smaller than in 1912, being 386 tons, but the value was practically the same and came to \$55,264.

The following are the producers for the year:

## List of Mica Mines and Companies

Name of Owner, Firm or Company	Name or location of mine	P.O. address of manager, etc.
*G. E. Allard .....	Loughborough Tp...	Rochester, N.Y.
Birch Lake Mining Co., Limited, The.....	Gould lake .....	115 York St., Ottawa.
*Brockville Mining Company .....	South Crosby Tp...	Elgin.
*Dominion Improvement & Development Co..	North Burgess Tp...	Box 26, Perth.
Dominion Mineral Exploration Syndicate..	Loughborough .....	Box 148, Sydenham.
Wm. E. & S. Silas, C. Ennis.....	Tett's mine, Bedford Tp. ....	Perth Road.
Kent Bros. & J. M. Stoness.....	Taggart mine .....	Kingston.
*Kingston Feldspar and Mining Company...		Kingston.
Loughborough Mining Co., Limited, The...	Lacey mine .....	Sydenham.
W. L. McLaren .....	North Burgess Tp...	Perth.
*New York & Ontario Mica Company .....		Perth Road.
*Scriven and Whyte .....	Sydenham .....	Sydenham.
Tett Bros. ....	Bedford Tp. ....	Bedford Mills.
J. W. Trousdale .....	Gould lake .....	Sydenham.
*Edward Watts and J. J. Noble.....		Perth.

Those marked \* did not produce any mica in 1913.

## Petroleum

The decline in the petroleum output in 1913 was not so great as it has been for some years past. The greatest production was in 1895, when the output was about 830,000 barrels. In 1906 again, owing to the discovery of the Tilbury field, another peak in the production was reached.

By districts the yield is as follows:

	1912 Bbls.	1913 Bbls.
Lambton .....	150,272	155,747
Tilbury .....	44,727	26,824
Bothwell .....	34,486	34,348
Dutton .....	4,335	4,610
Onondaga .....	7,115	4,172
Belle River .....	.....	465
Total .....	240,935	226,165

It will be seen that the decline is in Tilbury and Onondaga; Lambton shows a slight increase, which would no doubt have been greater had it not been for the havoc caused by severe gales on March 21st and November 10th, which blew down derricks and destroyed jerker lines, checking production for a time.

Prices for the year ranged from \$1.68 to \$1.89 per barrel, with an average of about \$1.80, plus bounty.

Mr. John Scott, Inspector, reports that 773 wells in all were abandoned during the year, of which 655 were in Petrolea, 38 in Tilbury, and the balance distributed between Oil Springs, Bothwell, Raleigh, Camden and Zone township.

The Refining Companies are:—

Imperial Oil Company.....	Sarnia.
Canadian Oil Companies.....	Petrolea.
Canadian Oil Producing and Refining Company.....	Petrolea.
Empire Company.....	Wallaceburg.
British American Company.....	Toronto.

The production of crude petroleum for the years 1909-10-11, in order to make up a five-year period with the statistics already given, is as follows:—

#### Petroleum Production by Districts, 1909 to 1911

Field.	1909	1910	1911
	bbl.	bbl.	bbl.
Lambton .....	243,123	205,456	184,450
Tilbury and Romney .....	124,003	63,058	48,707
Bothwell .....	38,092	36,999	35,244
Leamington.....	5,929	141	.....
Dutton .....	9,513	7,752	6,732
Onondaga (Brant Co.).....	.....	1,005	13,501
Total.....	420,660	314,410	288,634

As will be seen, the refineries import a large amount of crude oil, owing to the shrinkage in the production of the domestic crude.

#### Petroleum and Petroleum Products, 1909 to 1913

Schedule.	1909	1910	1911	1912	1913
Crude produced.....Imp. gal.	14,723,105	11,004,357	10,102,081	8,432,730	7,915,761
Crude distilled .....	35,530,918	36,171,032	38,632,504	46,270,701	53,821,592
Value crude produced \$	559,478	368,153	353,573	344,537	381,159
Value distilled products..... \$	2,501,384	2,511,368	2,294,396	3,592,230	3,068,312
Illuminating oil....Imp. gal.	17,902,254	18,983,357	20,240,523	23,090,280	21,415,010
Lubricating oil.....	3,856,778	4,469,038	4,729,257	5,932,166	6,144,193
Benzine and naphtha ..	3,930,691	4,297,615	4,179,575	4,955,022	7,349,015
Gas and fuel oils and tar.....	4,687,588	5,876,498	4,847,124	6,028,983	10,157,948
Paraffin wax and candles..... lb.	7,092,278	5,179,391	5,267,485	8,086,841	10,153,806
Workmen employed .. No.	436	428	511	699	781
Wages paid..... \$	261,014	280,485	314,851	436,852	559,556

#### Natural Gas Industry in 1913

Mr. G. R. Mickle, Mine Assessor, furnishes the following notes on gas:

Natural gas was derived from the three fields during the year. A brief sketch of each is given in the report dealing with the Composition of Natural Gas in Ontario in this volume. This also contains a map showing the gas producing areas. The total production for the year was 12,558.4 million cubic feet, and the distribution is as follows: (This includes estimated production from a number of very small operators who make no returns).

	Million cubic feet.
Welland-Haldimand-Norfolk, etc. . . . .	4,115.8 or 32.7 per cent.
Kent . . . . .	7,975.8 or 63.5 per cent.
Elgin . . . . .	466.8 or 3.8 per cent.

12,558.4 or 100 per cent.

This is almost identical with last year, both with regard to total and distribution. The total output for each field cannot be given in every case as in the early years of the productive life of the Welland-Haldimand field no complete record was kept of the output. The returns for 1906-13, both inclusive, show a total production of 30,007 millions for this field. For Kent the total now stands at 31,108 millions from the beginning of operations to the end of 1913, and for Elgin similarly 1,049 millions.

The old Welland-Haldimand field was extended by drilling a number of wells in Binbrook township, Wentworth county. This was the most interesting feature in connection with gas in the eastern part.

During the latter part of the year the drain on the Kent field was increased. The figures for next year will show a substantial advance in production.

The most important development in connection with the industry during the year was the discovery of a new field in Lambton county. During the summer of 1913 several wells were drilled in Enniskillen township at Oil Springs, and gas discovered in moderate quantity—several hundred thousand cubic feet capacity—but it was not till the Fairbanks well was drilled in March, 1914, and a well giving a larger flow of gas than any found hitherto in Ontario was disclosed, that the probable importance of this discovery was realized. It will be seen by reference to the analyses that this gas is quite different from any found hitherto in that part of the Province. Active drilling operations are now being carried on in that field to test the territory.

Dr. Fairbanks, owner of this well, kindly furnished the writer with the log for publication:

#### Fairbank Gas Well No. 1

Lot 18, Concession 2, Enniskillen  
March, 1914

Surface.....	75 feet	
Top Soap.....	106 feet	
Lime.....	17 feet	
Lower Soap.....	34 feet....	232 feet
Limestone and Dolomite.....	998 feet....	1,230 feet
Salt.....	35 feet	
Dolomite.....	57 feet	
Salt and Hard Streak.....	238 feet....	1,560 feet
Brown Dolomite.....	166 feet	
Salt.....	40 feet....	1,766 feet
Dolomite.....	127 feet....	1,893 feet
Dolomite (Light).....	5 feet....	1,898 feet
Dolomite Gas Rock.....	14 feet	
Total Depth.....		1,912 feet

Dr. Fairbanks in sending the log says: "Have omitted the big water vein and upper oil strata which all Oil Springs logs show." The oil strata are at 265 feet and 420 feet and water at 260 feet and 490 feet.

#### Regulations Concerning Gas and Oil Wells

Two Inspectors are kept in the field by the Department to enforce the regulations regarding the plugging of abandoned oil and gas wells. Mr. Donald Sharpe, who has charge of the Welland-Haldimand district, reports that in his district the drilling done during the year has made some welcome discoveries of gas. Thus the Provincial Natural Gas and Fuel Company of Niagara Falls, Ont., drilled two wells giving a measurement of more than a million feet each in the township of Bertie, which was supposed to be well explored.

The largest single producer in that district is the Dominion Natural Gas Company, which drilled 96 wells during 1913, of which 80 were productive.

During the year a pipe line 153 miles in length was laid from the Kent field to Hamilton, the reason for this being the difficulty of supplying the increased demand for gas from a territory in which the drilling is only able to maintain a stationary production.

In the western part of the Province the discovery of gas in Lambton county has been already alluded to under "Natural Gas in 1913" and also the "Composition of Natural Gas Found in Ontario."



Following is a list of the companies producing natural gas in 1913:

### List of Natural Gas Producers in 1913

Name of Person or Company.	Locality.	P.O. address of manager, etc.
Aldrich Gas & Oil Company, Limited, The...	Haldimand County..	Selkirk.
Beaver Oil & Gas Co., Limited, The.....	Tp. of Romney, Kent County .....	66½ Market Street, Brantford.
Beck and Aikens .....	S. Cayuga and Dunn Tps. ....	Dunnville.
Bertie Natural Gas Company, Limited.....	Bertie Tp. ....	Ridgeway.
Canadian Gas Company .....	Kent County .....	1426 Dime Bank Building, Detroit, Mich.
Canfield Natural Gas Company, Limited....	Canfield .....	Canfield.
Cheapside Gas and Oil Company, Limited....	Haldimand County..	Cheapside.
Chippewa Oil & Gas Company, Limited, The....	Lincoln and Haldi- mand Counties...	Tavistock.
Coleman, J. A.....	Tp. of Wainfleet....	Wellandport.
Commonwealth Oil and Gas Co., Limited....	Tp. of Onondaga....	165 Bay St. West, Hamilton.
Crystal Oil and Gas Co., Limited, The.....	Tp. of Onondaga....	Paris.
Dauskin, D.....	Tp. of Brantford....	Cainsville.
Dominion Natural Gas Co., Limited, The....	Counties of Lincoln, Wentworth, Elgin, Norfolk and Haldi- mand .....	842 Marine Bldg., Buffalo, N.Y.
Dunn Natural Gas Company, Limited, The...		Dunnville.
Empire Limestone Company .....	Welland County....	Buffalo, N.Y.
Enterprise Gas Company, Limited.....	Norfolk County ...	842 Marine Bldg., Buffalo, N.Y.
Gas & Oil Co. of Springvale, Limited, The....	Walpole Tp. ....	Springvale.
Hagersville Light and Fuel Co., Limited....	Hagersville .....	Hagersville.
Holmes Gas Company .....	Rainham & Walpole Tps. ....	Selkirk.
Home Natural Gas Company, Limited .....	Oneida Tp. ....	City Hall, Hamilton
Hoover, D. E. ....	Rainham Tp. ....	Rainham Centre.
Hoover, D. E., A. E., and Menno.....	Rainham Tp. ....	Rainham Centre.
Hoover, James E. ....	Walpole Tp. ....	Selkirk.
Humberstone Mutual Natural Gas & Fuel Co..	Humberstone .....	Humberstone.
Industrial Natural Gas Company .....	Tps. of Crowland & Humberstone ....	Port Robinson.
Kindy Gas Company .....	Rainham Tp. ....	Rainham.
Kindy, D., and Sons .....	Rainham Tp. ....	Selkirk.
Kohler and Aikens .....	Canboro Tp. ....	Dunnville.
Lalor, F. R. ....	Dunnville .....	Dunnville.
Lalor, Aikens and Smith.....	Sherbrooke and Dunn Tps. ....	Dunnville.
Lamb, Alfred .....	Walpole Tp. ....	Selkirk.
Lamb, Walter B. and R. W. Lamb.....	Walpole Tp. ....	Nanticoke.
Lint and Emerson .....	Canboro Tp. ....	Attercliffe Station.
Manufacturers Natural Gas Co., Limited (Distributor).....		842 Marine Bldg., Buffalo, N.Y.
Marshall, James .....	Haldimand County..	Hamilton.
Martin, Edward .....	Port Maitland .....	Port Maitland, Ont.
Mayer and Ross .....	Humberstone Tp. ..	202 Mutual Life Bldg., Buffalo, N.Y.
Medina Natural Gas Company, Limited, The	Elgin County .....	Chatham.
Midfield Natural Gas Company, Limited....	Tp. of North Cayuga	32 Stinson St., Ham- ilton.
Moote, Melick and Lymburner .....	Haldimand County..	Canboro.
Nanticoke Natural Gas Co., Limited, The....	Nanticoke .....	Nanticoke.
National Gas Company, Limited .....	Haldimand & Went- worth Counties ..	Rainham Centre.
Niagara Natural Gas and Fuel Co., Limited..	Humberstone Tp. ..	Sherkston.

## List of Natural Gas Producers in 1913—Continued

Name of Person or Company	Locality	P.O. address of manager, etc.
Norfolk Gas Company, Limited .....	Norfolk County ....	842 Marine Bldg., Buffalo, N.Y.
North Shore Gas Company .....	Shore of Lake Erie.	Hamilton.
Northwestern Gas Company, Limited .....	Brant County .....	15 Scott Block, Erie, Pa.
Onondaga Oil and Gas Co., Limited, The.....	Onondaga Tp. ....	Brantford.
Oxford Oil and Gas Company, Limited.....	Innerkip Tp. ....	Brantford.
Port Colborne-Welland Natural Gas and Oil Company, Limited, The.....	Brant and Haldimand Counties ...	Port Colborne.
Port Rowan Natural Gas Company.....	Norfolk County ....	842 Marine Bldg., Buffalo, N.Y.
Producers Natural Gas Company, Limited...	Haldimand County.	842 Marine Bldg., Buffalo, N.Y.
Provincial Natural Gas and Fuel Company of Ontario, Limited, The .....	Welland County ...	Niagara Falls, Ont.
Rolston, James, and Bennett, Robert.....	Canboro Tp. ....	Dunnville.
Snively, F. L. ....	Rainham and South Cayuga Tps. ....	Dunnville.
Southern Ontario Gas Company, Limited (Distributors) .....		St. Thomas.
Standard Natural Gas Company, Limited ..	Onondaga Tp. ....	Dunnville.
Standard Oil Company of Canada, Limited..	Humberstone and Moulton Tps. ....	Port Colborne.
Sterling Gas Company, Limited .....	Kent County .....	Tilbury, Ont.
Telephone City Oil and Gas Co., Limited....	Onondaga Tp. ....	Brantford.
Union Natural Gas Co. of Canada, Ltd., The.	Kent County .....	Niagara Falls, Ont.
United Gas Companies, Limited, The.....	Wainfleet Tp. ....	St. Catharines.
United Gas & Fuel Co. of Hamilton, Limited (Distributors) .....		72 James Street N., Hamilton.
Vansickle, A. W. ....	Onondaga Tp. ....	Onondaga.
Waines & Root Gas Co., Limited, The.....	Canboro, S. Cayuga, Dunn, Rainham & Walpole Tps.....	Dunnville.
Welland County Lime Works Company .....	Port Colborne .....	Port Colborne.
Widrick, M.....	Walpole Tp. ....	Nanticoke.

## Mining Revenue

The revenue received by the Government for the fiscal year ending 31st October, 1913, was \$621,392.97, being a decrease of \$12,000 approximately from the amount received during the preceding year. For the two years the statement stands as follows:

Service	12 mos. ending 31st Oct., 1912	12 mos. ending 31st Oct., 1913
Sales of mining land .....	\$51,634 48	\$95,068 94
Rental, leases, etc. ....	33,098 34	20,878 43
Miner's licenses, permits, fees.....	107,162 70	93,256 10
Mining Royalties .....	250,145 65	200,333 01
Mining Tax Act .....	190,875 53	211,063 84
Provincial Assay Office .....	654 00	404 75
Diamond drills .....	208 25	387 90
	<hr/> \$633,778 95	<hr/> \$621,392 97

It will be noticed that the sales of land and the Mining Tax Act revenues show an increase, the former being chiefly due to patents granted in Porcupine as a consequence of the large number of claims staked in 1910. Leases, royalties and miner's licenses show a decrease.

The table following gives details of the transactions regarding land. The totals do not agree with those given above, the difference being due to the fact that the first figures represent the amounts actually received within the fiscal year, while the second are the monies pertaining to the transactions consummated during the year.

### Mining Lands Sold and Leased for year ending October 31st, 1913

District.	Sales.			Leases.			Total.		
	No.	Acres.	Amount.	No.	Acres.	Amount.	No.	Acres.	Amount.
			\$			\$			\$
Timiskaming .....	654	25,527.43	69,446 33	223	8,808.22	8,808 22	877	34,335.65	78,254 55
Nipissing .....	1	163	163	12	505.02	505 02	13	668.02	668 02
Sudbury .....	10	830.45	1,279 63				10	830.45	1,279 63
Algoma .....	45	1,931.66	4,946 45				45	1,931.66	4,946 45
Thunder Bay.....	67	3,860.92	9,299 87				67	3,860.92	9,299 87
Kenora .....	25	1,090	2,898 50				25	1,090	2,898 50
Elsewhere.....	15	971.54	1,127 50				15	971.54	1,127 50
Total .....	817	34,375	89,161 28	235	9,313.24	9,313 24	1,052	43,688.24	98,474 52

### License and Recording Fees

The amount received under this head was somewhat less than in the preceding year. The various subdivisions are:

Miner's Licenses .....	\$44,065 80
Forest Reserve Permits .....	995 00
Recording Fees .....	48,195 30
	<hr/>
	\$93,256 10

### Royalties

The royalties, amounting to \$200,333.01, were derived from the following sources:

The O'Brien Mine .....	\$27,691 34
Crown Reserve Mining Company .....	93,650 78
Hudson Bay Mines .....	78,990 89
	<hr/>
	\$200,333 01

The total royalties paid by the various mines up to 31st October, 1913, stand as follows:

The O'Brien Mine .....	\$695,067 85
Crown Reserve Mining Company .....	705,641 69
Hudson Bay Mines .....	324,261 21
Chambers-Ferland Mining Company .....	26,259 64
Hargrave Silver Mines .....	1,200 00
Waldman Silver Cobalt Mining Company .....	777 48
Wyandoh Mining Company .....	1,421 72
Cobalt Provincial Mines .....	6,735 14
	<hr/>
	\$1,761,364 73

### Amount Collected on Account of Supplementary Revenue Act, 1907, for the year ending October 31st, 1913

Profit Tax .....	\$173,532 65
Acreage Tax .....	13,915 70
Gas Tax .....	23,615 49
	<hr/>
	\$211,063 84

The Supplementary Revenue Act, 1907, now called "The Mining Tax Act," provided for the appointment of an officer called the Mine Assessor, with duties and powers under this Act. Mr. G. R. Mickle has occupied this position since the Act came in force in 1907 and furnishes the following statement:

**Operations of the Mining Tax Act, R.S.O., 1914, Chapter 26, formerly called the Supplementary Revenue Act**

There are three taxes levied under this Act, namely:

1. Profit tax—at the rate of 3 per cent. on the profits of mines in excess of \$10,000, with the deduction of certain taxes paid municipalities.
2. Natural Gas tax—at the rate of two-tenths of a cent per thousand cubic feet, or \$2.00 per million.
3. Acreage tax—2 cents per acre on all mining lands situated in territory with no municipal organization.

The amount collected under this Act for the calendar year, 1913, was \$258,291.67, and is distributed as follows:

Profit tax .....	\$221,960 78
Natural Gas tax .....	24,780 49
Acreage tax (April 15th, 1913, to April 15th, 1914) .....	11,550 40
	\$258,291 67

This is approximately 25 per cent. more than the amount collected for 1912. There is an apparent increase in the profit tax of about \$45,000, but approximately \$19,000 of this belongs to 1912, and if this amount was deducted from 1913 and added to 1912 it would make the two very nearly equal in amount. There is an increase of about 25 per cent. in the Natural Gas tax. The Acreage tax is smaller, owing to overdue payments made on list advertised for forfeiture last year.

The Profit tax was contributed by seventeen different companies, the greater part coming from the silver mines of Cobalt. For the first time there is some revenue from the gold mines in the Province. Certain of the companies in the Cobalt district, paying a royalty to the Crown, may deduct any taxes paid from the royalty. Accordingly no tax is collected from these. If it were not for this fact the Profit tax would have been about \$30,000 greater and the royalty less by an equal amount. For the next few years there is no material alteration in the total amount that will be paid as Profit tax in sight.

The Natural Gas tax was paid by fifty-two companies and individuals, some of the amounts being quite small. There will probably be an increase in this in the immediate future and then a decline unless new fields are discovered.

With regard to acreage tax, no attempt has ever been made to keep the different years separate. Payments are made at all times throughout the year and in many cases several years' taxes are paid at one time.

In these statements taxes are credited to the year to which they belong. In the cases of the Profit and Natural Gas taxes these are based on the operations of the preceding year. As the tax is not due until October, and the fiscal year of the Province ends on the 31st of October, some payments fall in the succeeding fiscal year, so that these statements can never agree with the Public Accounts.

### Mining Companies

The number of mining, quarry and natural gas companies incorporated during the year was 119, with an aggregate capital of \$78,000,000, the amount of capital being somewhat greater than was represented by the companies incorporated in the previous year and the number of companies a little less.



The business for which these companies have been organized takes in the whole range of mineral products.

In addition to these companies of domestic origin, a certain number incorporated elsewhere were licensed to do business in Ontario.

Following are lists of both kinds:

### Mining Companies Incorporated in 1913

Name of Company.	Head Office.	Date of Incorporation	Capital.
A. E. Ponsford, Limited (Brick)	St. Thomas	March 7	\$60,000
Amalgamated Nickel-Copper Mining Company, Limited	Ottawa	June 5	1,000,000
Balsam Lake Quarries, Limited	Toronto	June 13	60,000
Barwick Mines Company, Limited	Emo	May 10	20,000
Black Fox Gold Mining Company, Limited	North Bay	September 9	1,000,000
Burnside Gold Mines, Limited	Haileybury	July 24	3,000,000
Calgary Brick and Supply Company, Limited	Toronto	May 26	200,000
Canada Feldspar Corporation, Limited	Toronto	September 3	100,000
Canadian Concrete Products Company, Limited	Toronto	April 21	50,000
Canadian Copper and Armour Plate Company, Limited	Toronto	December 31	1,000,000
Canadian Mineral Development Company, Limited	Toronto	July 30	40,000
Canadian Rand Goldfields, Limited	Toronto	September 22	1,000,000
Casey Majestic Mines, Limited	Toronto	December 17	40,000
Castings of Ottawa, Limited	Ottawa	August 8	40,000
Cleary Mines, Limited	Toronto	November 15	1,000,000
Clevenger-Prophet Silver Mines, Limited	Toronto	May 2	1,500,000
Cobalt Comet Mines, Limited	Toronto	April 16	1,000,000
Cobalt South Silver Mining Company, Limited	Toronto	December 27	1,000,000
Cochrane Mines of Cobalt, Limited	Toronto	April 17	400,000
Commonwealth Gold Mines, Limited	Toronto	June 9	1,000,000
Consolidated Brick and Tile Company, Limited	Toronto	June 12	40,000
Co-Operative Brick Company, Limited	Toronto	September 5	1,000,000
Credit Forks Tile and Brick Company, Limited	Toronto	February 14	100,000
Crookston Stone Company, Limited	Toronto	June 13	50,000
Crystal Lake Mines, Limited	Toronto	July 29	40,000
Dominion Brick and Tile Company, Limited	Toronto	August 12	200,000
Dominion Reduction Company, Limited	Cobalt	September 15	2,000,000
Empire Marble Company, Limited	Toronto	February 17	1,000,000
Eureka Cement Pressed Brick Company, Limited	Toronto	June 16	40,000
Galeta Silver Mines, Limited	Toronto	May 22	500,000
General Exploration Company, Limited	Toronto	November 1	250,000
Gosselin Gold Mines, Limited	Toronto	May 31	2,000,000
Grand Gypsum, Limited	Hamilton	April 4	250,000
Gravenhurst Crushed Granite Company, Limited	Toronto	September 5	100,000
Gull Lake Gold Mines, Limited	Haileybury	September 2	1,500,000
Haliburton Development Company, Limited	Lindsay	February 20	40,000
Hamilton Corundum Company, Limited	Palmer Rapids	January 16	200,000
Hamilton Molybdenum Alloys Company, Limited	Hamilton	December 26	500,000
Homestake Mines Finance Company, Limited	Toronto	April 28	1,000,000
Hunton Gold Mines, Limited	Toronto	July 17	2,500,000
James Cornhill Sons, Limited (Brick)	Chatham	March 3	30,000
Jarvis Oil and Gas Company, Limited	Toronto	January 15	40,000
Kerr-Addison Mines, Limited	Toronto	March 13	2,000,000
Kirkland Lake Development Company, Limited	Toronto	October 27	40,000
Kirkland Lake Gold Mines, Limited	Haileybury	February 25	1,000,000
La Mine D'Or Huronia, Limited	Ottawa	August 15	1,000,000
Lincoln Clay Products, Limited	St. Catharines	July 15	50,000
Maple Sand, Gravel and Brick Company, Limited	Toronto	April 10	100,000
Marten Lake Mining Company, Limited	Gowganda	November 29	2,000,000
Millerton Gold Mines, Limited	Toronto	March 12	3,000,000
Moffat-Irving Steel Works, Limited	Toronto	August 8	100,000
Morse Porcupine Mines, Limited	Toronto	April 14	1,000,000
Mount McKay Products, Limited	Fort William	December 10	600,000
Mountain Lake Silver Mines, Limited	Toronto	April 15	500,000
Napanee Brick and Tile Company, Limited	Napanee	April 28	100,000
National Gas Company, Limited	Toronto	January 25	500,000
New Ontario Pressed Brick Company, Limited	Sudbury	December 15	10,000
Niagara Brick and Tile Company, Limited	Niagara Falls	October 1	100,000
North Star Cobalt Mines, Limited	Toronto	May 8	1,000,000
Northern Building Material and Iron Company, Limited	Sault Ste. Marie	October 21	50,000
Ontario Granite Crushed Stone Company, Limited	Gravenhurst	January 8	60,000
Ontario Steel Products Company, Limited	Gananoque	October 16	1,500,000
Orr Gold Mines, Limited	Toronto	August 20	2,000,000
Pleindorf Porcupine Mines, Limited	Toronto	March 7	1,500,000
Porcupine Crown Mines, Limited	Toronto	May 26	2,000,000
Queen City Pressed Brick Company, Limited	Toronto	January 22	200,000
Rideau Silicate Company, Limited	Ottawa	April 22	400,000
Salvator Silver Mine, Limited	Cobalt	March 17	1,000,000
Schaefer Brick Company, Limited	New Hamburg	January 25	75,000
Sharon Mines, Limited	Cobalt	July 2	500,000
Sherrill Porcupine Gold Mines, Limited	Toronto	May 28	1,000,000
Southern Ontario Gas Company, Limited	Hamilton	April 22	400,000

## Mining Companies Incorporated in 1913—Continued

Name of Company.	Head Office.	Date of Incorporation	Capital.
Standard Crushed Stone Company, Limited	Niagara Falls	April 7	200,000
Sulphide Chemical Company, Limited	Toronto	May 13	40,000
Superior Sand and Towing Company, Limited	Fort William	February 21	100,000
Sutherland Construction Company, Limited	Toronto	May 29	40,000
Sylvanite Gold Mines, Limited	Haileybury	June 13	2,000,000
Teck-Hughes Gold Mines, Limited	Toronto	April 8	2,000,000
Temagami Chief Mines, Limited	Toronto	March 3	2,500,000
The Alexo Mining Company, Limited	Toronto	January 8	40,000
The Balmy Beach Land and Building Company, Limited	Toronto	April 3	40,000
The Birch Lake Mining Company, Limited	Ottawa	April 24	250,000
The Cameron Island Syndicate, Limited	Hamilton	July 30	200,000
The Century Pressed Brick and Tile Company, Limited	Georgetown	November 11	250,000
The Champion Brick and Tile Company, Limited	Kingsville	November 18	75,000
The Cobalt Reduction Company, Limited	Toronto	October 8	350,000
The Credit Valley Stone Company, Limited	Toronto	December 2	250,000
The Crews-McFarlan Mining Company, Limited	North Bay	January 4	3,000,000
The Crow Lake Ironland Company, Limited	Toronto	June 26	100,000
The Dominion Clay Products Company, Limited	Toronto	May 5	150,000
The Electric Steel and Metals Company, Limited	Welland	May 20	500,000
The Flaville Mining Company, Limited	Toronto	August 14	250,000
The Florica Mining and Milling Company, Limited	Toronto	March 17	400,000
The Gravel, Sand and Crushed Stone Company, Limited	Toronto	May 10	50,000
The Hepworth-Silica Pressed Brick Company, Limited	Hepworth	December 4	125,000
The Independent Natural Gas Company, Limited	Dunnville	March 11	300,000
The International Hematite Company, Limited	Fort Frances	March 3	1,000,000
The Kingsdale Brick Company, Limited	Toronto	February 19	100,000
The Kohinoor Gold Mines, Limited	Toronto	August 7	2,000,000
The McGrenere Brick and Tile Company, Limited	London	May 13	40,000
The Mikado Consolidated Gold Mines, Limited	Toronto	March 29	2,000,000
The Ontario Stone Corporation, Limited	Toronto	January 30	75,000
The Ore Extension Mining Company, Limited	Hamilton	November 1	1,500,000
The Point Pelee Sand and Gravel Company, Limited	Point Pelee	June 6	20,000
The Ramsden Sand, Gravel and Brick Company, Limited	Toronto	October 29	100,000
The Renfrew Molybdenum Mines, Limited	Mount St. Patrick	December 8	1,500,000
The Renfrew White Granite Company, Limited	Ottawa	January 25	250,000
The St. Petersburg Graphite Mining Company, Limited	Toronto	July 30	500,000
The Toronto Clay Products, Limited	Toronto	April 23	300,000
The Wallaceburg Gas Company, Limited	Wallaceburg	July 24	200,000
The Wallaceburg Oil Refining Company, Limited	Tp. of Chatham, Wallaceburg P.O.	September 26	200,000
The Wasabika Mines, Limited	Toronto	July 25	1,000,000
Tough-Oakes Gold Mines, Limited	Haileybury	June 12	3,000,000
Trout Creek Gold Mines, Limited	St. Catharines	January 29	150,000
Vaughan Sand and Gravel Company, Limited	Toronto	December 4	100,000
Wadsworth Lake Mining Company, Limited	Gilmour	May 28	60,000
Wapoose Mines, Limited	Ottawa	May 17	100,000
Waterloo Brick and Tile, Limited	Toronto	May 5	75,000
Windsor Sand and Gravel Company, Limited	Windsor	September 30	40,000

## Mining Companies Licensed in 1913

Name of Company.	Head Office for Ontario.	Date of License.	Capital for use in Ontario.
Algoma Land Company, Limited	Port Arthur	October 1	\$100,000
Beacon Oil Company	Chatham	April 26	25,000
British America Nickel Corporation, Limited	Toronto	July 17	20,000,000
Ontario National Brick Company, Limited	Toronto	January 8	1,000,000
T. F. Firth and Sons, Limited	Toronto	March 25	40,000
The Associated Gold Mines of Western Australia, Limited	Almonte	July 24	£15,000
The Federal Stone and Supply Company, Limited	Ottawa	December 23	\$40,000
The Georgian Bay Mining Company, Limited	Windsor	January 20	40,000
The Porcupine Central Development Syndicate, Limited	Toronto	November 7	150,000
Tonkin-Du-Pont Graphite Company	Wilberforce	July 14	125,000
United States Steel Products Company	Toronto	September 22	40,000
Vermont Marble Company	Peterborough	October 16	100,000

## Radium

The Legislature having passed an Act authorizing a bonus to be paid to the discoverer of a workable source of radium (4 Geo. V, chap. 15), it may be of interest to describe the system of measurement used in determining the amount of radium in any material, especially as there has been the greatest confusion in the methods used. In the following notes there is also given a description of the more important radium-bearing materials, an account of the discovery in Germany of a highly radio-active water, and the finding of an interesting source of radium in connection with salt.

#### Explanation Regarding Units of Measurement used in Connection with Radium

It will be noticed that use is made of the Mache unit in the descriptions given. As there was confusion owing to the fact that different authorities employed different units in measuring radio-activity, an International Radium Standard Commission was appointed to settle the question. The conclusions of this Commission are given in a bulletin issued by the Physikalisch-Technische Reichsanstalt in Berlin. They agreed to accept a preparation of pure radium chloride made by Madame Curie, weighing 21.99 mg. (about one-third of a grain) as the international standard. The emanation from this is measured and from that the emanation that would be given by 1 gram pure radium can be calculated. That is called a curie. This is a very large unit, and accordingly the calculated emanation from a milligram is more frequently used; this is a millicurie. (The equation for converting Mache units into millicuries is  $1 \text{ millicurie} = 2.7 \times 10^6 \text{ Mache units}$ ). As the numbers that are dealt with in radio-active measurements are very large, they are written as given above,  $10^6 = 1,000,000$  of course. One millionth would be written  $10^{-6}$ . With very little practice this system of writing will be found to be far the most convenient and therefore is adopted in this description. According to above given equation 1,000 Mache units would equal  $3.7 \times 10^{-4}$  or  $37 \times 10^{-5}$  millicuries. Several of the below mentioned measurements are over 1,000 Mache units. Comparing that with the radio-activity of other waters, Prof. A. S. Eve\* gives the radio-activity of the waters of the Caledonia Springs near Ottawa as  $15 \times 10^{-8}$  millicuries. According to Moore and Schlunt, Bull. 395 U. S. Geol. Survey, the most active waters in Yellowstone Park have an activity of about one-quarter that of the Schweizergang Quelle, which was the most active water known in Europe. The strongest water in Yellowstone was equivalent to  $268 \times 10^{-5}$  millicuries per litre. The Schweizergang is therefore equal to a little more than  $10^{-5}$  millicuries per litre, or an activity of 1,000 Mache units is nearly 37 times as strong as the Schweizergang Quelle.

#### Characters of Radium Ores

A considerable number of uranium-bearing minerals are known, but most of them occur only in small quantities. Among the uranium compounds represented by these minerals are arsenates, carbonates, niobates, oxides, phosphates, silicates and sulphates. However, the ores or minerals from which radium is being extracted at present consist essentially of carnotite, pitchblende and autunite.

The following descriptions of a few of the more important uranium minerals are taken mainly from Dana's System of Mineralogy, 6th edition.

*Uraninite.* There are several closely related minerals that come under this heading. The mineral to which the name more properly applies contains the oxides of uranium and lead, together with nitrogen, etc. ( $\text{UO}_3$ ,  $\text{UO}_2$ ,  $\text{PbO}$ ,  $\text{N}$ , etc.). When crystallized the mineral occurs in octahedrons and other forms of the isometric system. It is usually, however, massive or botryoidal (consisting of a group of rounded prominences) and is known as *Pitchblende*.

Uraninite and pitchblende are brittle minerals, with an uneven or conchoidal fracture. The hardness is 5.5, or between that of apatite and orthoclase and less than that of quartz. The specific gravity is comparatively high, being for crystals 9 to 9.7 and for massive altered forms 6.4 or more. The lustre is submetallic to greasy or pitch-like, and dull. The color is greyish, greenish, brownish or velvet-black; streak brownish-black, greyish, or olive-green, a little shining, opaque.

Among the varieties of uraninite may be mentioned, (1) Clevite, which has been found in crystals in the Villeneuve mica mine in Quebec; in addition to the oxides found in uraninite proper, those of the yttrium earths are found in clevite. (2) Bröggerite is similar in composition but contains thorium oxide in addition to the other constituents, (3) Urannibate is another variety of the mineral that occurs in crystals in coarse granites (pegmatites) in Norway.

\* Trans. Roy. Soc. of Canada, 1910, Vol. IV, Sec. III.



Pitchblende, and the other varieties of uraninite, before the blowpipe, are infusible or only slightly rounded on the edges, sometimes coloring the outer flame green. With borax and salt of phosphorus the minerals give a yellow bead in the oxidizing flame, which becomes green in the reducing. With soda on charcoal they give a coating of lead oxide, and frequently the odor of arsenic. Soluble in nitric and sulphuric acids, the solubility differs widely in different varieties, being greater in those kinds containing the rare earths. Not attracted by the magnet.

The chief characteristics of carnotite and autunite may be summarized as follows:\*

*Carnotite.* Amorphous, perhaps slightly crystalline; pulverulent, in crusts intimately mixed with quartzose sands; color, canary yellow; specific gravity, 4.136; chemical formula,  $K_2O \cdot 2VO_3 \cdot V_2O_5 \cdot 3H_2O$  (?), uranyl potassium vanadate (?) containing barium and calcium; content of metallic uranium, 52-57 per cent.; found in Colorado, Utah and South Australia.

*Autunite.* Crystallization, orthorhombic; in plates or tabular crystals, pearly lustre, or in micaceous aggregates; translucent; brittle; cleavage, basal; color, bright yellow; hardness, 2 to 2.5; specific gravity, 3.5 to 3.9; chemical formula,  $Ca(VO_2)_2 \cdot (PO_4)_2 \cdot 8H_2O$ , uranium and calcium phosphate; content of metallic uranium, 49-50.5 per cent.; found in Connecticut, Massachusetts, Pennsylvania, North Carolina, South Carolina, Utah, France, Madagascar, Portugal, China, Cornwall, Austria and Germany.

It may be added that the silver deposits at Cobalt in their mineral content resemble closely those of Joachimstal, Austria, which have been the most important producers of pitchblende. Practically three generations of minerals are found in the veins at Cobalt, that is minerals have been deposited at three different periods. At Joachimstal, on the other hand, deposition has taken place during five periods, and, unfortunately, the period of deposition which is represented by the pitchblende at Joachimstal is unrepresented at Cobalt. Hence, our deposits have not been found to contain radium-bearing ores.

The radio-active properties of minerals may be detected by the effect they have on photographic plates or by means of the electroscope.

The hydrous mineral, gummite, occurs as a result of the alteration of uraninite. Coracite appears to be uraninite partly altered to gummite. The following note on coracite is taken from the *Geology of Canada*, 1863, page 504: "An ore of this rare metal (uranium) is said to occur at Maimanse, where it forms a vein about two inches in width, at the junction of the trap and syenite. It was first described in 1847 by Dr. J. L. Leconte as a new ore of uranium under the name of coracite. It is amorphous, pitch-black in color, with a grey streak, a resinous lustre, and a conchoidal fracture. Its hardness is 3.0, and its density 4.38. According to Mr. J. D. Whitney, who subsequently analysed it, it is distinguished from pitchblende by its ready solubility in cold hydrochloric acid, and contains oxyd of uranium 59.30, lime 14.44, oxyd of lead 5.36, oxyd of iron 2.24, alumina 0.90, silica 4.35, carbonic acid 7.47, water 4.64, with traces of magnesia and manganese=98.70. Mr. Whitney, with much probability, suggests that the oxyd of lead, and a portion of the lime, are to be regarded as combined with the sesquioxyd of uranium.

"Uran-ochre, in the form of a sulphur-yellow crystalline crust, has been observed lining fissures in the magnetic iron ore of Madoc," and in Snowdon township, Peterborough county.

Prospectors for radium-holding minerals should pay special attention to those having a pitchy lustre, and to those having a bright yellow color and occurring as incrustations or impregnations.

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\* Bulletin No. 70, page 92, United States Bureau of Mines.



## Discovery of Radio-Active Waters

The following paragraph is translated from *Jahrbuch für das Berg-und Hüttenwesen im Königreich Sachsen*, 1913 (S.B. 175).

Work was energetically carried on in the region of the Marx Semmler adit to discover radio-active water and emanation. In a number of places levels were driven on barren veins belonging to the iron-stone formation; a shaft was sunk under difficult conditions 16 metres under the Marx Semmler adit on the Radium vein, and 91 metres of caved and filled level were drained and space made to set up a diamond drill. Three holes were sunk, with a total length of 353 metres. The results attained can be regarded as satisfactory. The drift off the Marx Semmler adit on the Radium vein was 78 metres long and 38 metres under the surface. At one point along this, 22 litres of water per minute were found with 218 Mache units. Near the end at one spot a very radio-active thread or tiny flow of water was encountered, giving 1.6 litres per minute and showing an activity of 1,440 Mache units. This thread was followed and 2.8 litres of water found with 1,660 Mache units. In October a separation of the rich water was undertaken whereby a quantity of 330 litres with 4,015 Mache units was found. Later on two diamond drill holes were sunk here; the first reached a depth of 117 metres and crosscut as intended stringers of the main vein. Water at the rate of 18 litres per minute with 1033 Mache units was found. The second hole was 85 metres deep and gave 60 litres per minute with 582 Mache units. Then a winze was sunk on the Radium level 26 metres. The mixture of water found in sinking showed an activity of 178 Mache units. From this winze a drift was run 25 metres to pass under the Marx Semmler adit on one of the veins in order to cut off the veinlets of water coming from below which enriched the water of the Marx Semmler adit (giving 300 litres per second) by about 10 Mache units. The workings on the Gleesberg vein, off the Marx Semmler adit, were cleaned out and drained in order to find out where the highly active water which flows out of the adit came from. At a distance of 100 metres this was accomplished and a flow of 40 litres per minute with 185 Mache units was discovered. Another stringer was followed for 27 metres and 2 litres per minute found with 306 units activity. A diamond drill hole was sunk here for 150 metres and disclosed 32 litres of water per minute with 1,180 Mache units.

The work of a number of investigators shows that while radio-activity can be found in all rocks, the eruptive ones show it to a greater extent.

Near the northeast corner of the map by Herman Müller of the Schneeberg district is seen an intrusion of granite. The adit mentioned in above description is also located here. The description of these mines, which were reopened and worked for about forty years, closing in 1893, does not indicate that they were rich in uranium minerals; the only mines where these minerals were obtained are over a mile distant from the place where the very radio-active waters were found. It is curious that this is just where in the olden days the most wonderful specimens and blocks of silver ore were found. It would almost seem as if the radio-activity of the waters in this case was due to radium in the rock and not to radium-bearing minerals in the veins.

In speaking of radio-active waters it should be remembered that the radio-activity may be due either to salts of radium dissolved in the water, in which case the radio-activity will last for years, or it may be due to the radium emanation absorbed by the water; in such cases the activity only lasts a matter of a few days.

## Radium Associated with Salt

An interesting source of radium is described by Becker and Holthusen (Ueber absolute Radiumbestimmungen mit dem Emanometer). It appears that in the course of refining the salt at Kreuznach the saline water is caused to trickle through beds of brush to aid evaporation and catch suspended sediment.\* From time to time this material is burnt and the ash forms a source of radium. The amount given is

\* Handbuch der Kali-Industrie S. 319. Chem. Technologie.

$1.8 \times 10^{-9}$  gram radium for each gram of ash. This residue, of course, is diluted by the ash from the brush itself. The ash is first treated with dilute hydrochloric acid and a very little sulphuric; this will dissolve the alkaline salts of the ash. The solution is then filtered; all the radium remains in the residue, which is carefully washed. Then it is boiled several times with a concentrated soda solution and treated with a little hydrochloric acid to convert the carbonate into a chloride; then a little sulphuric acid is added and all the radium is precipitated as sulphate. This is less than 5 per cent. of the original ash in amount and may be taken as the starting point. If we multiply  $1.8 \times 10^{-9}$  by 20 we will have approximately the amount of radium in this material. It will give, of course,  $3.6 \times 10^{-8}$  gram radium for each gram of precipitate. To compare this with other sources of radium, according to the paper by H. W. Schmidt and H. Nick (*Physik. Zeitschr.* XIII, 1912, s. 200), as long as the uranium content of any mineral is known the radium can be calculated according to the following equation, viz.: for each gram uranium metal there is  $3.4 \times 10^{-7}$  radium metal. Now uraninite or pitchblende, the richest uranium mineral, contains about 60 per cent. uranium; therefore, for uraninite the equation would be for each gram pure mineral there is  $3.4 \times 6 \times 10^{-8}$  radium or practically just six times as much radium as in this precipitate. For carnotite, which is exciting so much interest in Colorado now and of which the shipping ore contains only 2 per cent. of uranium, the equation would be for each unit of ore there are  $6.8 \times 10^{-9}$  units radium or practically five times as much in this precipitate as in the carnotite ore that is shipped.

An analysis of the Kreuznach brine showed it to have the following composition:

Sodium chloride .....	=1.42 per cent.
Calcium chloride .....	=0.26 per cent.
Magnesium chloride .....	=0.02 per cent.
Traces of Bromine and Iodine.	

### D discovery of Chrome Iron Ore and Diamonds

A few years ago Mr. R. A. A. Johnston, of the Geological Survey of Canada, made the interesting discovery that microscopic diamonds occur in certain chrome iron ore of British Columbia.\* Later he found diamonds in similar ore from Quebec province and from other parts of the world.

In March, 1914, the Provincial Geologist, Mr. W. G. Miller, submitted a sample of chromiferous ore or rock to Mr. Johnston for examination for diamonds. A week or so later Mr. Johnston wrote that "the work [of examination of the sample] has only been partially completed, but it has revealed the presence of thousands of microscopic diamonds. These accord in general with the diamonds which I have found under somewhat similar circumstances in other parts of Canada and also in specimens from a number of foreign localities. In their mode of occurrence, however, they differ in one important respect from any which have come under my notice, inasmuch as they may be observed in the silicious portions of the mixture. In one instance this morning we were able to find a distinct octahedron perched on the corner of one of the specimens and as indicated right in the silicious portion."

These Ontario diamonds, while of no apparent economic value, are of course of great scientific interest, especially as they represent the first authentic discovery of diamonds in the Province. The sample examined by Mr. Johnston was sent as a specimen of iron ore to Mr. Miller by Mr. D. O'Connor, who obtained it from his claims in Reame township, which lies about twenty miles north of Porcupine.

Basic igneous rocks similar to that in which the chrome iron ore and diamonds have been found are somewhat widespread in the areas surrounding Porcupine. The sample examined is very basic and was much decomposed, containing serpentine, some of which evidently represents original phenocrysts of olivine. In some samples from the same locality there are numerous veinlets of asbestos (chrysotile). Associated with the rock in places is pyrrhotite, some of which is nickeliferous. The basic rock at the Alexo nickel mine, in the township of Dundonald, twelve or fifteen miles to the southeast of Reame, apparently belongs to the same series.

The Provincial Assayer, Mr. W. K. McNeill, found the diamondiferous rock to contain 8.46 per cent. of metallic chromium, or 13.44 per cent. of the oxide of chromium, 14.58 per cent. of metallic iron, and .066 oz. of platinum (value about \$1.50) to the ton of 2,000 lb.

It is hoped that careful prospecting will lead to the discovery of ore richer in chromium than the sample described. The platinum appears to be readily concentrated, by mechanical means or by fusion, with the chromium. If a workable chromite deposit is discovered the platinum should be recoverable as a by-product.

It has long been known that diamonds occur in the drift or loose deposits in several of the states immediately to the south of the Ontario boundary. This drift, to a large extent, represents material swept off the surface of Ontario by the ice sheet or glaciers and carried southward during the Pleistocene or Glacial period. Hence, it seems reasonable to believe that the home of these diamonds was originally in some part of northern Ontario. If the pipes or necks or dike-like orifices through which the diamondiferous rocks of Reame and elsewhere ascended towards the surface were discovered, it is possible that larger diamonds might be found, conditions for crystallization having been more favorable.

Platinum, diamonds, even if they are only microscopic, and chromium in one comparatively small specimen make an interesting series. It is hoped that in addition to gold and nickel the Porcupine area will also become a producer of chrome iron ore.

As a producer of nickel and cobalt, Ontario has only one important competitor, New Caledonia, a French penal colony in the southern Pacific. That colony is also one of the world's most important producers of chrome iron ore. Ontario's production has practically killed the cobalt industry in New Caledonia, and the Province's

\* Memoir No. 26, Geol. Sur., Canada.

output of nickel now far surpasses that of the French colony. It would be rather remarkable were the Province to enter into competition as a producer of a third mineral.

Although careful search was made in British Columbia for diamonds of economic value, after the discovery of the microscopic specimens, no stones of value have been found. The same may be said of other parts of the world in which microscopic diamonds occur. But there is satisfaction in now being able to say that diamonds do occur in the Province. To the old, often asked question, "Are there diamonds in Ontario?" an affirmative answer can now be given.

### Mining Divisions

There were no changes in the Mining Divisions or the Mining Recorders during the year. The list of Divisions and Recorders, together with receipts, follows:—

Mining Division.	Name and P.O. Address of Recorder.	Receipts.				Total Receipts.
		Purchase Money.	Miner's Licenses.	Forest Reserve Permits.	Recording Fees.	
Kenora .....	W. L. Spry, Kenora.....	\$ 2,555 50	\$ 578 00	.....	\$ 388 50	\$ 3,522 00
Port Arthur .....	J. W. Morgan, Port Arthur.....	10,250 64	2,250 00	.....	3,037 00	15,542 64
Sault St. Marie..	S. T. Bowker, Sault Ste. Marie.....	5,502 13	293 00	.....	2,480 00	8,275 13
Sudbury .....	C. A. Campbell, Sudbury.....	2,177 38	4,179 00	2,0 00	5,621 50	12,247 50
Gowganda .....	H. E. Sheppard, Gowganda.....	3,526 21	1,134 00	210 00	1,033 00	5,903 21
Montreal River..	A. Skill, Elk Lake .....	2,932 21	1,030 00	121 00	924 75	5,007 96
Temiskaming....	G. T. Smith, Haileybury.....	6,182 04	9,580 00	100 00	2,491 30	19,353 34
Parry Sound....	H. F. McQuire, Parry Sound.....	192 00	130 00	.....	60 00	352 00
Larder Lake.....	J. A. Hough, Matheson .....	8,229 58	2,358 00	.....	20,535 25	31,122 83
Porcupine.....	G. H. Gauthier, Porcupine.....	56,653 41	3,935 00	390 00	8,397 00	69,375 41
Total.....		98,170 10	25,467 00	1,091 00	44,958 30	170,702 02

The Recorders report the work at their offices as follows:—

#### Kenora

W. L. Spry, Recorder. During the year 45 miner's licenses issued for full year; 11 for part of year; 1 special renewal and 6 ordinary renewals. The small volume of business transacted at this office is an indicator of the lack of activity in mining during the year in this part.

#### Port Arthur

J. W. Morgan, Recorder, reports 280 miner's licenses issued and 170 renewals, with 182 claims recorded and 379 certificates of full performance of working conditions. The matters which attracted most attention were the discovery of nickel near Big Duck lake, north of Schreiber, and the deposits of hematite south of Shebandowan lake.

#### Sault Ste. Marie

S. T. Bowker, Recorder. Miner's licenses issued, 108; renewed, 185, with 127 claims recorded.

#### Sudbury

C. A. Campbell, Recorder. 352 licenses issued and 455 renewals. Total claims recorded, 483, and 442 claims cancelled.

The West Shining Tree district attracted most attention from the prospectors during the year.

#### Elk Lake

Albert Skill, Recorder. Miner's licenses issued, 45, with 161 renewals and 63 claims recorded. Prospects for activity this season are good.



**Gowganda**

H. E. Sheppard, Recorder. This office issued 94 licenses and renewed 192. Applications to record claims were 68 and certificates of work 132.

The feature in this division is the success at the Miller Lake-O'Brien mine.

**Timiskaming and Coleman**

George T. Smith, Recorder. This office issued 590 miner's licenses and 1,326 renewals. There were 265 applications to record claims.

**Larder Lake**

J. A. Hough, Recorder. Total number of licenses issued and renewed was 492, and 1,575 applications to record.

The Kirkland Lake district accounts for the activity in this mining division. There was also a stir in townships of Munro, Beatty and Maisonsville.

**Parry Sound**

H. F. McQuire, Recorder. Only 43 licenses were issued by this office. Work was done on a few iron claims.

**Porcupine**

G. H. Gauthier, Recorder, reports 191 miner's licenses issued and 643 renewals. Number of claims recorded, 496.

**Provincial Assay Office**

Mr. W. K. McNeill, B.Sc., Provincial Assayer, reports as follows for the year 1913:

The Provincial Assay Office was established at Belleville, Ont., in 1898, as an aid, in a practical manner, in the development of the mineral resources of the Province, this object being attained by the sampling and assaying of ores and rocks for the prospectors and others at a reasonable fee, by the analysis of rocks, etc., for the geologists of the Bureau of Mines and by original research along lines suggested by the officers of the Bureau.

In November, 1911, the laboratories were removed from Belleville to Toronto, Ont., and established at No. 5 Queen's Park, as the pressing need for larger accommodation was recognized. By the results since obtained it has been found that the present location is much more central and convenient for the Bureau of Mines as well as the public.

The Chemical Laboratories and Assay Office are among the most up-to-date in the Province, and are especially designed and equipped for accurate work; but so as not to encroach on the professional domain of private assayers and testing laboratories, a fee is charged for all public work, the purpose being to have a laboratory to assist prospectors and do umpire work.

The work consists of:

(a) Examination and assaying of samples received from prospectors, mining engineers, geologists and the public generally.

(b) Analysis of samples of rocks, etc., for the geologists of the Bureau of Mines.

(c) The sampling of carload lots of cobalt silver ores shipped from the mines, upon which the Government collects a royalty. This work is done at the various smelters and is in charge of Mr. T. E. Rothwell, Assistant Assayer.

(d) The assaying and valuation of these car lots.

(e) Special research work.

During the year just closed the work has been naturally much along the lines of former years. Notwithstanding the fact that no new fields were opened up, a large number of gold and silver samples passed through the office and during the year it was noted that there was an increasingly larger number of samples sent in from all parts of the Province for identification. By the enquiries received concerning clays, pyrites, etc., it would appear that the public interest is not confined to the more precious metals, but work is being carried on in all branches of the industry. The specimens examined may be more conveniently arranged as follows:

*Assays for Gold and Silver.*—During the year two hundred and seventy-seven samples were examined for the public and one hundred and fifty samples for the Bureau, which include car lots, each lot being represented in the report as one sample.

*Iron Ores.*—During the year thirteen samples of ore were examined and reported upon. These were analyzed for silica, iron, sulphur and phosphorus and in some cases titanium.

*Copper Ores.*—Copper content of fourteen ores were determined.

*Nickel Ores.*—Thirteen samples were reported upon during the year and a large number were sent in for identification.

*Cobalt Ores.*—The work here was entirely on the estimation of the cobalt oxide in the shipments from the different mines.

*Rocks and Limestones.*—Altogether fifty-one samples were examined—forty-three for the Bureau and eight for the public.

*Miscellaneous.*—Under this head are included identifications analysis of molybdenite, tin ore, potash-bearing rocks, clays, supposedly platinum-bearing sands, infusorial earths, corundum and chromium ores. In addition, information was given regarding the value of ores, rocks, etc.; also methods of development. Some original research was carried on under instruction from the Provincial Geologist, the results of which will be published separately.

The following is the new schedule of fees which is now in operation. Copies may be obtained by applying to the Provincial Assayer, No. 5 Queen's Park, Toronto, Ont.

#### Schedule of Charges

Samples will be dealt with in the order of their arrival. In every instance specimens and samples should be accompanied by statements specifying the precise locality from whence they were taken.

*Directions.*—Crushed samples representing large quantities or samples less than five pounds weight may be sent by mail as third class mail matter. Write your name and address plainly on each parcel. Send instructions, with money in payment of fees, in a separate letter. Samples may be sent by express, charges prepaid.

Sample bags addressed to this laboratory for sending ore pulp by mail may be obtained free on application; also, canvas bags for shipping.

*Terms.*—Money in payment of fees, sent in by registered letter, postoffice order, postal note, or express order, and made payable to the Provincial Assayer, must invariably accompany sample to insure prompt return of certificate, as no examination is commenced until the regulation fee is paid.

Samples addressed as follows:

To

Provincial Assay Office,  
5 Queen's Park,  
Toronto, Ont.

#### Tariff of Fees for Analyses and Assays

##### 1. Assays:

Gold . . . . .	\$1 00
Silver . . . . .	1 00
Gold and Silver in one sample . . . . .	1 50
Platinum . . . . .	4 00
Gold and Platinum in one sample . . . . .	5 00
Gold by amalgamation . . . . .	2 00
For the amalgamation assay for gold at least five pounds of ore must be sent.	

##### 2. Iron Ores:

Iron (metallic) . . . . .	\$1 00
Silica . . . . .	1 50
Iron and insoluble residue . . . . .	1 50
Ferrous Oxide . . . . .	2 00
Phosphorus . . . . .	2 00
Sulphur . . . . .	2 00
Iron, Sulphur, Phosphorus and insoluble . . . . .	5 00

Manganese . . . . .	2 00
Titanium . . . . .	2 00
Complete analysis: Ferrous Oxide, Ferric Oxide, Total, Metallic Iron, Silica, Alumina, Lime, Magnesia, Manganese, Phosphorus, Sulphur and Titanium . . . . .	15 00
3. Limestones, Dolomites, Marls, Clays, Shales:— Determination of:	
Insolubles . . . . .	\$1 00
Silica . . . . .	1 50
Ferric Iron . . . . .	2 00
Ferrous Iron . . . . .	2 00
Alumina . . . . .	2 00
Lime . . . . .	1 50
Magnesia . . . . .	1 50
Alkalies (combined) . . . . .	5 00
Potash . . . . .	4 00
Water (combined) . . . . .	1 00
Moisture . . . . .	0 50
Organic matter . . . . .	1 00
Carbon Dioxide . . . . .	1 50
Phosphorus Anhydride . . . . .	2 00
Sulphur . . . . .	2 00
4. Examination of Clay, Shale or Cement Rock for cement manufacture. Determination of:	
Silica, Iron Oxide, Alumina, Lime, Magnesia, Sulphuric Anhydride and Volatile Matter . . . . .	\$10 00
5. Coal, Coke, Peat, etc.: Determination of:	
Moisture . . . . .	\$0 50
Volatile combustible . . . . .	1 00
Fixed carbon . . . . .	1 00
Ash . . . . .	1 00
Sulphur . . . . .	2 00
Phosphorus . . . . .	2 00
Calorific value . . . . .	5 00
Ultimate analysis . . . . .	Price on application
6. Mineral waters . . . . .	Price on application
7. Ores and Minerals: Determination of:	
Alumina . . . . .	\$2 00
Antimony . . . . .	3 00
Arsenic . . . . .	3 00
Bismuth . . . . .	3 00
Cadmium . . . . .	3 00
Chromium . . . . .	3 00
Cobalt . . . . .	3 00
Copper . . . . .	2 00
Gold . . . . .	1 00
Ferrous Oxide . . . . .	2 00
Ferric Oxide . . . . .	2 00
Lead . . . . .	2 00
Lime . . . . .	1 50
Magnesia . . . . .	1 50
Molybdenum . . . . .	2 00
Manganese . . . . .	2 00
Nickel . . . . .	3 00
Silica . . . . .	1 50
Water . . . . .	1 00
Zinc . . . . .	2 00
8. Rocks, complete analysis . . . . .	Price on application
9. Slags, Sands, etc. . . . .	Price on application
10. Identification of minerals and rocks not requiring chemical analysis. . . . .	Free
Any chemical work not specified in this circular will be undertaken on application to the Provincial Assayer.	
The pulp of each sample is retained for future reference.	



Port Colborne Plant of the Canadian Furnace Company, Limited.



## MINING ACCIDENTS IN ONTARIO IN 1913

By T. F. SUTHERLAND, Chief Inspector of Mines

During the year 1913 in and about the mines, metallurgical works and quarries regulated by the Mining Act of Ontario, there were 57 fatal accidents, causing the death of 64 men. Of these fatal accidents 32, causing the death of 37 men, occurred underground; 7, causing the death of 8 men, on the surface; 11, causing the death of 11 men, at metallurgical works; 7, causing the death of 8 men, at quarries. The tables of accidents at the metallurgical works and quarries are separated in this Report from accidents at the mines.

The total number of serious accidents in and about the mines of Ontario reported to the Bureau of Mines in 1913, was 353, resulting in 45 persons killed and 320 injured; of these accidents 284 occurred underground, and 69 above. The fatal accidents took place in mines operated by 19 different companies, the same number as in 1912.

At metallurgical works there were 212 accidents which caused the death of 11 and serious injuries to 201 men.

At quarries there were 18 accidents which caused the death of 8, and serious injuries to 12 men. It is evident that all the non-fatal accidents at quarries are not reported to this Department.

In accordance with the Mining Act inquests were held on all fatal accidents and attended by one of the Inspectors.

The following table shows that on an average 2 men received serious injuries in the mining industry on nearly every working day of 1913.

Table of Accidents

	1912.		1913.	
	Killed.	Injured.	Killed.	Injured.
<b>Mines :—</b>				
No. killed underground .....	26	.....	37	.....
No. " surface.....	6	.....	8	.....
No. injured underground.....	.....	160	.....	251
No. " surface .....	.....	56	.....	69
<b>Metallurgical Works :—</b>				
No. killed.....	10	.....	11	.....
No. injured.....	.....	122	.....	201
<b>Quarries :—</b>				
No. killed.....	1	.....	8	.....
No. injured .....	.....	3	.....	12
Totals.....	43	341	64	533

The following classification distributes the responsibility for the cause of the fatalities:

	Per cent.
1. Fatalities due to danger inherent to the work itself ....	19, or 29.7
2. " arising out of defects in mine workings .....	16, or 25.
3. " due to fault of fellow workman .....	3, or 4.7
4. " due to fault of workman himself .....	26, or 40.6

By months, the 64 fatalities occurred as follows:—

January, 10; February, 12; March, 9; April, 6; May, 8; June, 2; July, 5; August, 6; September, 1; October, 2; November, 2; December, 1; Total 64.

During the first six months of the year, 47 men were killed, compared with 17 during the latter six months.

### Analysis of Fatalities at Mines

A comparison of the causes of the fatalities at the mines for 1912 and 1913 is as follows:

Cause.	1912	1913
	Per cent.	Per cent.
Falls of ground .....	9.4	11.1
Shaft accidents .....	25.0	20.0
Explosives .....	21.9	31.1
Miscellaneous (underground) .....	25.0	20.0
Surface .....	18.7	17.8

While it is to be hoped that the number of deaths from accidents is abnormal for the year 1913, yet it will be seen that a large number are the result of want of proper care on the part of the workman and those in charge, and also a lack of proper appreciation of the risks inherent to the nature of the industry.

Sixty-five per cent. of the fatal accidents during the year could have been avoided by the exercise of greater caution on the part of the workmen, and by the mine operators insisting on a strict enforcement of the Mining Act. There are several mines in Cobalt which have a good record, especially during the past two years. These mines must necessarily employ the same class of labor as adjoining properties, yet their accident rate is much lower than the average of the camp.

An example of what can be accomplished in accident prevention by intelligent effort is furnished by the Canadian Copper Company, at Copper Cliff. Mr. E. T. Corkill, formerly Chief Inspector of Mines for the Province of Ontario, was appointed Safety Engineer for this company on July 1st, 1913. The accident lists published in this report show that for the first six months of 1913, this company had 11 men killed; for the last six months, 3. Of serious accidents which incapacitated the workmen for over five weeks, the first six months shows 40 men, and the last six months, 17. A corresponding decrease is noticed in the minor accidents.

To decrease the accidents requires as honest an effort as to decrease the costs, or to increase the production. To issue general rules without seeing that these rules are observed may be a protection in damage suits, but will not diminish the number of accidents.

**Table of Fatal Accidents in Mines, Metallurgical Works and Quarries, 1901 to 1913**

—	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	Total.
Persons killed at Metallurgical Works and Mines.....	13	10	7	7	9	11	22	47	49	48	49	43	64	379
Persons employed at Metallurgical Works and producing mines.....	4,135	4,426	3,499	3,475	4,415	5,017	6,305	7,435	8,505	10,862	12,543	13,108	14,293	97,918
Persons employed at non-producing mines (estimated) ..	550	450	400	400	500	750	1,140	1,750	2,000	2,000	2,000	2,000	2,000	15,940
Total persons employed .....	4,685	4,876	3,899	3,875	4,915	5,767	7,345	9,185	10,505	12,862	14,543	15,108	16,293	113,858
Fatal accidents per 1,000 employed .....	2.77	2.05	1.79	1.80	1.83	1.90	2.99	5.11	4.66	3.73	3.37	2.84	3.93	3.34

## Cause and Place of Fatalities in Mines

The following schedule shows the cause and place of the fatalities in 1913 compared with 1912:—

Below ground:—	1913.	1912.
Falls of grounds .....	5	3
Shaft accidents:—		
Falling down shaft .....	1	4
Objects falling down shaft .....	2	2
Falling from bucket .....	0	1
Attempting to get on or off skip or cage in motion .....	4	1
Falling cross-head . . . . .	2	0
	— 9	— 8
Explosive accidents:—		
Premature explosion while loading or lighting holes .....	8	0
Drilling into bottom of old or missed holes .....	5	1
Asphyxiation from gases from explosives.....	1	5
Picking or putting bar into old hole containing explosive ....	0	1
	—14	— 7
Miscellaneous accidents:—		
Falling down winze .....	1	3
Falling down stope .....	1	2
Struck or buried by ore .....	4	2
Struck by bar while barring ore from chute .....	0	1
Struck by falling objects .....	2	0
Crushed between cars .....	1	0
	— 9	— 8
Above ground:—		
Blowing up of thawing house .....	0	1
Struck by falling objects .....	0	2
Electrocuted .....	2	1
Killed by fall .....	3	1
Burned .....	0	1
Caught by machinery .....	2	0
Crushed by car .....	1	0
	— 8	— 6
Total . . . . .	—45	—32

The occupation and nationality of men killed in or about the mines are set out in the following table:

Occupation.	English Speaking.	Finn.	Italian.	Pole.	Swede.	Austrian.	French.	Total.
Deck hand .....				1				1
Oiler .....	1							1
Lamp tender .....			1					1
Drill runner .....	5	3	2	1	1	2		14
Trammer .....	3		2	4		3		12
Drill helper .....	2	1	1			1		5
Laborer .....	1							1
Skip tender .....	1			1				2
Carpenter .....	2							2
Chute tender .....		1						1
Powderman .....	1			1				2
Pipe fitter .....		1						1
Electrician .....	1							1
Mill man .....							1	1
Totals.....	17	6	6	8	1	6	1	45

The ages of the men killed at the mines were as follows:—

17-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	Total.
3	11	15	11	4					1	45

#### Cause and Place of Non-Fatal Accidents at Mines

The following schedule shows the cause and place of the non-fatal accidents in 1913 at the mines and the number injured:—

Underground:—

Falls of ground ..... 9

Shaft accidents:—

Cage accidents ..... 9

Falling part way down shaft ..... 7

Objects falling down shaft ..... 6

Miscellaneous ..... 3

— 25

Explosives:—

Drilling into old or missed holes ..... 6

Picking into explosives ..... 4

Premature explosion ..... 6

— 16



## Miscellaneous accidents:—

Falling down stopes, raises, winzes, chutes or man-ways .....	23
Jammed by cars, skips, buckets or pieces of rock or ore .....	60
Scaling .....	19
Foreign material in eyes .....	2
Injured at chutes .....	24
Burned .....	5
Flying rock .....	4
Rock rolling down pile .....	20
Caught by drill .....	18
Falling objects .....	15
Miscellaneous .....	18
— 208	

## Surface:—

Falling from elevated places .....	12
Caught by machinery .....	12
Burned by electric wire .....	1
Falling objects .....	14
Burned .....	1
Miscellaneous .....	22
— 62	

Totals ..... 320

The occupation and nationality of the men injured in or about the mines were as given below:—

Occupation.	English Speaking.	Italian.	Pole.	Finn.	Russian.	Austrian.	Rumanian.	Spanish.	Syrian.	German.	Bulgarian.	Swede.	Nationality Unknown.	Total.
Hoistman .....													1	1
Mill Man .....	8	1												9
Drill Runner .....	28	9	7	34								1		79
Trammer .....	3	21	35	12	4	11	1	4			2		1	94
Laborer .....	3	8	6	2					1					20
Pumpman .....	1			1										2
Drill Helper .....	9	2	6	17	1	1	1			1				38
Carpenter .....	4	1												5
Timberman .....	6			2	1					1		1		11
Nipper .....	1				1	1								3
Foreman .....	13	2												15
Machinist .....	6				1									7
Cage Tender .....		2	3	1		1								7
Teamster .....	2		1											3
Pipe Fitter .....	2													2
Ore Sorter .....	1		1											2
Crusher Man .....	1	1	1		1	2								6
Painter .....		1												1
Blacksmith .....	1	1												2
Blacksmith's Helper .....		1	1											2
Engineer .....	1													1
Scaler .....				2										2
Chute Tender .....			3	2										5
Deck Man .....					1									1
Electrician .....	1													1
Surveyor .....	1													1
Totals .....	92	50	64	73	10	16	2	4	1	2	2	2	2	320

The ages of the men injured at the mines were as follows:—

17-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	Unknown	Total
16	115	76	43	25	11	8	1	0	0	25	320

The following table shows the time during which the injured persons were incapacitated for work.

Class of Work	1 to 2 Weeks	2 to 3 Weeks	3 to 4 Weeks	4 to 5 Weeks	5 to 6 Weeks	6 to 7 Weeks	7 to 8 Weeks	8 to 9 Weeks	9 to 10 Weeks	10 to 12 Weeks	Over 12 Weeks	Permanent	Not Reported Cured	Totals
Mines—														
Above ground .....	24	13	5	3	4	2	1	2	2	1	1	0	2	60
Below ground .....	85	40	35	20	11	7	7	7	2	8	11	7	20	260
Metallurgical Works.....	99	34	14	7	9	3	4	4	3	4	6	1	13	201
Quarries.....	1	4	.....	.....	1	1	1	.....	.....	.....	.....	.....	4	12
Totals .....	209	91	54	30	25	13	13	13	7	13	18	8	39	533

### Mining Regulations and How Observed

The investigations by this Department into many of the accidents during the past year show a non-observance of the Mining Act by some operators and many employees, and emphasize forcibly the need of further Government supervision. The Mining Act is wide in its requirements, and penalties are provided for non-observance. Infringements have to be proven in court on information laid by the Inspector. The policy so far followed has been to take action only in flagrant cases where life has been endangered. Thus, it is only after an accident has happened that a prosecution follows. The result has been that, in several instances, mine operators have taken chances with dangerous conditions, trusting that they could get through without an accident and have the work completed before an Inspector visited them. The men under ground handle powder carelessly, drill into old bottoms, and follow other dangerous practices, knowing that, if caught by the foreman, the worst that will happen is to be discharged, and they know that they can go to the next mine and obtain employment. Foremen rarely report an infringement of the Mining Act to the Inspector. The result is that careless and reckless workmen drift from mine to mine, endangering their own safety and that of their fellow workmen.

If only licensed men were allowed to be in charge of actual mining operations, and if the holding of such a license depended upon the safety of the mining methods followed, it would tend to decrease the high accident rate of the mines of Ontario.

### Falls of Ground

Five men were killed during 1913 as a result of falls of ground, an increase of two over the preceding year. In addition, two men were so seriously injured that a fatal termination of the accident is expected during the present year.

At the Garson mine on January 14th a sledger in No. 33 stope was killed while helping to take down some bad ground. He thought he was standing at a safe distance.

At the Henderson talc mine, near Madoc, operated by Cross and Wellington, on March 17th a large block of talc fell, carrying out the timbers and injuring three men, two of whom died from the injuries received. One of the men killed had noticed some small pieces of talc falling about ten minutes before the big fall, but, being inexperienced, did not realize the danger or act on the warning given.

At the Temiskaming mine on March 25th a fall of ground occurred between the 200- and 300-foot levels, carrying out the timbers at the cross-cut chute, No. 1 vein, and killing a trammer who was loading his car at this chute.

At the Creighton mine on December 9th the brow of the open pit on the north side slipped into the open pit, carrying with it the pillars, and crushing the dry walls on the fifth level. One man was killed; one had his back broken; one sustained a fractured skull; one had his leg broken; several others received minor injuries. The fall was due to a slip about 40 feet back from the brow, which dipped into the pit about 250 feet below the surface. Approximately 230,000 tons of rock fell.

This accident shows the necessity for removing the overburden around such pits in order to detect any slips or fissures.

At the Northern Pyrites mine on November 6th a Finnish drill helper was injured, receiving a direct concussion of the spine, with paralysis of lower extremities, through being struck by a slab of ore which was being drilled in order to be blasted down. Attempts to take down this slab with scaling bars had been unsuccessful. The injured man thought he was at a safe distance from the slab if it fell.

The latest hospital reports indicate that the injured man has no chance of recovery, although he may live for a considerable time.

### Shaft and Winze Accidents

Ten men were killed during the past year in shaft and winze accidents, a decrease of one compared with the preceding year.

Seven of these accidents were the result of a direct infringement of the Mining Act—two on the part of the company, four on the part of the men killed and one on the part of a fellow workman.

On January 8th an employee of the Right of Way Mining Company was killed by a falling crosshead. This crosshead was not equipped with a safety device, and the company was fined \$250 and costs.

On February 22nd an employee of the Canadian Gold and Silver Mining Company was killed by a falling crosshead which was not equipped with a safety device.

At the inquest held in connection with this accident the jury brought in a verdict charging the management with criminal negligence. The manager was arrested, and the case was subsequently dismissed by the magistrate on account of the jury naming the management. It was held that the manager could not be considered the management.

On January 5th an employee of the Canadian Copper Company was killed at the Creighton mine while stealing a ride on the skip.

On October 28th at the same mine an employee was sent up in the timber skip with an injured workman. Evidently considering that the injured man was capable of looking after himself, and not wanting to climb down the ladders, he attempted to jump off the moving skip at the fourth level and was killed.

On July 14th at the Long Lake gold mine a skip tender jumped on the skip to save a climb of fifteen feet. He was caught against the timber and instantly killed.

On February 18th at the Cobalt Lake mine, while the men were being sent to the surface, a Pole was killed while attempting to board the cage after the hoisting signal had been given.

On January 15th at the Fourth of July shaft of the Nipissing Mining Company, while the cage tender was unloading steel at the first level, a Finnish drill runner on the second level rang the hoisting signal. The cage tender was caught by a steel and killed.

The above accidents were all caused by non-compliance with the Mining Act.

On January 20th at the Frood Extension mine of the Mond Nickel Company, a cleat used to support the door at the collar of the shaft was jarred loose and fell, killing a workman at the bottom of the shaft.

On August 29th at the same mine while a bucket of rock was being hoisted the cable broke, and the falling bucket killed a workman in the shaft.

On February 16th, while timbering in a winze from the Meyers shaft of the Nipissing Mining Company, a corner of the staging became loosened, allowing a workman to fall a distance of twenty-five feet. He sustained a fracture of the base of the skull which resulted fatally twelve hours later. The presence of a chain ladder in the winze saved a fellow workman from injury.

Several accidents during the past year were due to an inferior type of cage. The man-cages used by the Inland Steel Company must be constructed according to the following description:—

#### Cages

"Bonnet shall be made of steel plate, 3-16-inch in thickness, sloping toward each side and so arranged that it may be readily pushed upward to afford egress to persons therein, and such bonnet must cover the top of the cage in such a manner as to protect those on the cage from objects falling in the shaft. The cage will be provided with sheet iron or steel side casing, not less than  $\frac{1}{8}$  inch thick, or with a netting composed of wire not less than  $\frac{1}{8}$  inch in diameter, and with doors made of suitable material. These doors shall extend at least five feet above the bottom of the cage and must be closed when lowering or hoisting men, except timbermen riding on the cage to attend to timbers that are being lowered or hoisted. Every cage must have overhead bars of such arrangement as to give every man on the cage an easy and secure handhold. Every cage or skip used for hoisting men must be provided with a safety catch of sufficient strength to hold the cage or skip with its maximum load at any point in the shaft in the event that the hoisting cable should break."

#### Accidents from Explosives

During the year 1913 sixteen men were killed in accidents due to the use of explosives, as against seven fatalities in 1912 and sixteen in 1911. This represents 25 per cent. of the total number of fatalities in and around the mines, metallurgical works and quarries in the Province of Ontario.

Of the fatalities under ground 38 per cent. were due to explosives. In addition five men were totally blinded, two men had the sight of both eyes partially destroyed, one man had his hand blown off, and two men had three fingers blown off; altogether 47 men were killed and injured in 31 accidents occurring at 25 different mines and quarries.

An analysis of these accidents shows a deplorable recklessness and lack of knowledge on the part of the workmen in the handling of explosives. Of the 31 accidents, resulting in the death of 16 men and the total disability of 5 others, probably only 7, resulting in one fatality, can be said to have been unavoidable.

At the Hudson Bay mine, Gowganda, two miners, using hand steel, deliberately cleaned out an old hole and started drilling in it. Evidently the hole was partly filled with small pieces of rock, as, after drilling about two minutes, an explosion occurred, which killed both men and injured a trammer who was working near them.



At the North Dome mine, Porcupine, a drill runner started a hole within three inches of the collar of an old hole, but lined up his machine so that it ran into the old hole about eighteen inches from the collar. The helper was killed and the drill runner lost the sight of both eyes.

At the Cobalt Townsite mine a hammer-drill runner was killed while loading back holes. From the nature of his injuries it is surmised that he allowed the flame of his carbide lamp to strike the powder while examining a cut-off hole.

Two men were killed while loading a 20-foot hole with gelignite at the Intercities Quarry, Port Arthur. The probable explanation is that they were ramming the explosive too hard.

At the Hudson Bay mine, Cobalt, one man was killed and one totally blinded by drilling into a cut-off hole. It was known that there was one report short from the previous round. In this case, owing to a slip, it would have been hard to detect the cut-off hole, but there was plenty of room to drill a hole in such a position that there would not be any possibility of its intersecting the cut-off hole.

At Moose Mountain a drill runner was taking up a section of the floor of the open pit so that a track could be laid. While drilling a pop hole an explosion occurred which killed him. The maps and records of the company showed that it was in 1910 that this particular part of the mine had been worked out.

At the Hollinger mine two men, while lighting a round of holes, received injuries which resulted fatally. At the inquest the jury brought in a verdict that the premature explosion was due to a quick fuse.

At the property of the Dane Copper Company two men lost the sight of both eyes through an explosion caused by drilling into a cut-off hole. Johnson, drill runner, had taken a contract for the underground work and was squaring up the face in one of the drifts. It was his first underground work at this property.

At the Coniagas mine two men were killed while preparing to load a round of holes. There was no evidence to show the cause of the explosion. This is the first fatal accident at the Coniagas mine, which has been operated continuously since 1904.

At the Hollinger Reserve mine two men were killed while preparing to refire some missed holes. An investigation of this accident indicated that the men were attempting to remove the tamping from one of the holes with an iron scraper.

At the Magpie mine a drill runner was attempting to fire a round in a raise with a battery. Being unable to get an explosion, he disconnected the battery, wound the wires round the air line, and climbed up in the raise to see if the connections were at fault. Lightning struck the surface plant, followed the air line under ground and exploded the holes. The man was instantly killed.

At the Cobalt Lake mine, while examining a cut-off hole, one man was totally blinded and one had the sight of both eyes partially destroyed. The rock at the collar of the hole was shattered and the explosion occurred while the drill runner was removing some of this rock with his hands. It was the first shift for both men at this mine.

Two accidents occurred while block-holing; the block being drilled contained a cut-off hole.

Three accidents resulted from men not seeking shelter when the blasters were sand-blasting. In each case sufficient warning was given.

Two accidents were the result of striking powder or detonators in the broken ore.

At the North Dome mine a miner was refiring a round when he was overcome with gas. The evidence at the inquest showed that he had succeeded in lighting the holes and was back from the face about eighteen feet when overcome. About half an hour after the explosion he was taken to the surface, but died shortly afterwards.

Two accidents resulted from curiosity regarding detonators. One man held a lighted cigarette against a detonator; another found a short piece of fuse with a detonator attached in the broken ore. He lighted the fuse and held it. In both cases three fingers were blown off.

The following rules to be observed in the handling of explosives are taken from the Rule Book of the Nipissing Mining Company, Limited. This Rule Book is published in English, French and Finnish.

#### Explosives

##### Extracts from the Mines Act of Ontario:

"Cases containing explosives shall not be opened in the magazine and only implements of wood, brass or copper shall be used in opening the cases.

"Any employee who commits a careless act with an explosive, or where explosives are stored, or who, having discovered it, omits or neglects to report immediately such act to an officer in charge of the mine, shall be guilty of an offence against this Act, and the officer in charge of the mine shall immediately report such offence to the Inspector or to the Crown Attorney of the County or District in which the mine is situate.

"In charging holes for blasting, no iron or steel tool or rod shall be used, and no iron or steel shall be used in any hole containing explosives, and no drilling shall be done in any hole that has been blasted, nor shall any iron or steel tool be introduced into the bottom of any such hole.

"When a miner fires a round of holes he shall count the number of shots exploding, except in case of instantaneous blasting by electricity. If there are any reports missing he shall report the same to the mine captain or shift boss. If a missed hole has not been fired at the end of a shift, that fact, together with the position of the hole shall be reported by the mine captain or shift boss to the mine captain or the shift boss in charge of the next relay of miners, before work is commenced.

"A charge which has missed fire shall not be withdrawn, but shall be blasted, and no drilling shall be done in the working place where there is a missed hole or a cut-off hole containing explosive until it has been blasted."

All blasting powders do best work and give off least gas and smoke when they are thoroughly thawed.

Never thaw powder near a fire of any kind, or in hot water or steam. Always thaw through some medium of radiation, never by direct heat or contact.

Never use frozen or chilled powder.

Never use powder that shows white crystals on the wrapper.

Never use an ore sack for carrying powder. Use nothing but the regular powder bag.

Never put caps and fuse in a powder bag.

Never put unused or scraps of powder in boot-legs or on shelves of rock. Put it directly into the waste powder box provided for that purpose.

Never keep explosives in a damp place before loading.

Never take your powder underground until you are ready to use it. Plan your work so that you fire a charge as soon as it is loaded. Powder which is put into holes too soon and allowed to stand becomes chilled and the breaking power is reduced. Chilled powder may not entirely explode and there is then danger of the unexploded powder getting mixed with the broken rock.

Never force powder into a tight or caving hole.

Never reload a hot hole, either from burning or from springing. Give it plenty of time to cool.

Never lace a fuse through a stick of powder. This may crack the fuse and make a miss fire or a burnt hole. All primers must be punched with a WOODEN PIN and the cap inserted ONLY in the END and made fast by tying with string.

Never place your primer anywhere but on top of the last stick in the hole.

Never blast until you are sure that every entrance to the face being blasted is guarded. Never blast until you have thoroughly arranged with others working near you, at what time you will blast and which direction you will take when going out.

Never light a fuse until the charge has been thoroughly tamped. Tamping gives the powder a better chance to break, providing the hole itself has been solidly filled with powder. Tamping may prevent a premature explosion, sometimes caused by fuse powder falling into an un-tamped hole.

Never use a dynamite paper torch or carbide lamp for lighting fuse. Always use notched-fuse spitter.

Never spit fuse until you have examined all ladders and run-ways and are sure they are in proper condition. Always have more than one light when spitting.

Never, from first to last, let your light come near powder. Be sure your light is not hanging directly over powder or caps. Keep it to one side.

Never get careless with powder. It is manufactured to explode under certain conditions, and if you give it any chance at all, it is going to do exactly what it was made for. Keep it away from shock, sudden changes of temperature, fire, etc.

When sinking, all firing must be done by electric current.

When using lighting current, be sure all switches have been thrown out and properly guarded before commencing to connect your wires.

Never take a chance on firing a battery round when there is an electrical storm.

#### Caps

In order to set off dynamite properly, it is necessary to give it a strong, sharp shock. Caps are made and used for that purpose. That being the case, it is only common sense to keep powder and caps away from each other until the final preparation has been made. Caps are more sensitive to shock than powder. Use in greater degree the same precautions necessary with powder.

#### Fuse

Always keep fuse in a cool, dry place. Before loading a hole, run the fuse through your fingers, in order to detect if possible, any cracks or thin or swollen places. Any of these may cause a quick fuse or miss-fire. Never use any fuse that is not regular in size, or that looks cracked or bad in any way.

When spitting a round of holes, always look for signs of a quick fuse. Keep this in mind all the time. If there are two or more men in the face, one of them should continually watch while the other is busy spitting.

Never carry fuse and caps around your hat brim.

Report to the Captain immediately anything about Powder, Fuse and Caps, which you have reason to believe may be faulty.

The following table of accidents from the use of explosives gives the nature and cause of accident and the explosive used:—

## Accidents resulting from the

No.	Date	Number injured.	Name of Mine.	Explosive used.
1	Jan. 11	1	Moose Mountain.....	Detonator.....
2	" 17	1	Colonial.....	Not known.....
3	" 20	1	Creighton.....	C. and H. Dynamite.....
4	" 22	1	Cobalt Lake.....	Cheddite.....
5	Feb. 8	1	No. 2 Mine.....	C. and H. Dynamite.....
6	" 20	3	Hudson Bay Gowganda.....	Cheddite.....
7	" 20	1	Garson.....	C. and H. Dynamite.....
8	Mar. 4	1	North Dome.....	Gelignite.....
9	" 7	1	Canada Iron Corporation.....	Dynamite.....
10	" 21	2	North Dome.....	Forcite.....
11	" 26	1	Cobalt Townsite.....	C.X.L. Dynamite.....
12	April 7	2	Intercities Quarry.....	Gelignite.....
13	May 20	2	Hudson Bay Cobalt.....	Forcite.....
14	" 20	2	Hollinger.....	C. and H. Dynamite.....
15	June 9	2	Miller Lake O'Brien.....	Forcite.....
16	July 1	1	Moose Mountain.....	Hamilton Dynamite.....
17	" 17	2	Perth Road Lead Mine .....	C.X.L. Dynamite.....
18	" 23	2	Dane Copper Co.....	C.X.L. Dynamite.....
19	Aug. 23	2	Coniagas.....	C.X.L. Dynamite.....
20	" 26	2	Hollinger Reserve.....	Forcite.....
21	Sept. 1	1	Magpie.....	C.X.L. Dynamite.....
22	" 6	1	Crean Hill.....	C. and H. Dynamite.....
23	" 8	3	North Star.....	Not known .....
24	" 17	2	Cobalt Lake.....	Dinitrolite.....
25	" 25	1	York Ontario.....	Forcite or Detonator.....
26	Oct. 14	2	Hollinger.....	C. and H. Dynamite.....
27	" 18	1	Creighton.....	C. and H. Dynamite.....
28	Nov. 17	1	Foley O'Brien.....	Forcite.....
29	" 29	2	Canada Cement Co.....	C.X.L. Dynamite.....
30	Dec. 15	1	No. 3 Mine.....	Forcite.....
31	" 21	1	Crean Hill.....	Detonator.....
TOTAL ..		47		



## use of explosives during 1913.

## Nature and cause of accident.

Held a lighted cigarette to detonator; 2 fingers and thumb blown off. Incapacitated for 48 days.

One report short, man returned as explosion occurred; eyes filled with dust. Incapacitated for 12 days.

Walked past sand blast as explosion occurred. Back and side cut and bruised. Incapacitated for 14 days.

Was starting a hole about 3 inches from old bottom. Spark probably ignited powder. Cheek bone fractured.

Explosion occurred while barring chute. Face and hand cut. Incapacitated for 11 days. Miners using hand steel started drilling in an old bottom. Both were killed, and a trammer working nearby injured by shock.

Drilled into a missed or cutoff hole while blockholing. Incapacitated for 88 days.

While refiring round was overcome by gas and died five minutes after being brought to surface.

Walked into blast after ordinary warning had been given. Jaw fractured and ear blown off. Started hole  $2\frac{1}{2}$  inches from collar of old hole and intersected old hole at 18 inches. Helper killed and runner totally blinded.

Hammer drill runner was killed while loading back holes. Flame from lamp probably ignited powder.

Powderman and helper killed while loading a 20-foot hole. Cause of explosion unknown. Drilled into a cutoff hole. Helper killed and runner totally blinded.

Premature explosion caused by "quick" fuse, according to machine runner. Runner lived 8 days. The helper died from gas poisoning 3 hours after accident.

Shift boss had hand blown off, and helper slightly injured. Explosion occurred while removing powder from hole.

Plugger drill operator killed by drilling into powder in floor of open pit. Powder must have been there since 1910.

Drill runner and helper slightly injured. Fire from fuse ignited loose dynamite around collar of hole.

Drilled into cutoff hole. Drill runner and helper totally blinded.

Drill runner and helper killed while preparing to load holes. Cause of explosion unknown.

Drill runner and deckman killed. Probably removing tamping from hole with iron scraper.

Drill runner killed. Shooting in raise with battery, and had wires from charge wrapped around air-line. Lightning struck air-line on surface and exploded holes.

Did not seek shelter when blasters shouted warning. Shoulder bruised and arm cut. Incapacitated for 12 days.

Slight injuries. Premature explosion, due to holes not being properly tamped.

Removing shattered rock from collar of cutoff hole. Runner lost the sight of both eyes. Helper partially blinded.

Picked into explosive in broken ore. Injuries not serious.

Picking up bottom when explosion occurred. Injuries not serious.

Eye injured from premature explosion of sand blast. Powder not sufficiently covered.

Eyesight partially destroyed. Picking in broken ore when explosion occurred.

Tamping jammed cartridge when explosion occurred. Men received numerous cuts and bruises.

Head and eye injured. Drilled into explosive while blockholing.

Lighted a short piece of fuse with detonator attached and held same; 3 fingers blown off.

### Miscellaneous Accidents

Eight men were killed underground during the year in miscellaneous accidents, an increase of 3 over the preceding year.

A trammer was killed at the Creighton mine, on January 15th, by being struck by falling ice.

At the same mine on May 26th, a chute blaster crawled part way into a chute to place powder. He was caught and killed by falling ore.

At the same mine on July 7th, a trammer was killed by being caught between a loaded and an empty car. This accident was due to powder smoke on the level from chute blasting, preventing the car crews from seeing one another in time to avoid a collision.

At the Garson mine on March 14th, a machine runner was killed by a rock rolling down the stope. Blasting to start a chute was the cause of the accident.

At the same mine, on October 9th, a shoveller, while starting the ore in the stope, was caught and carried down with the ore.

At the Victoria mine, on May 29th, a trammer was killed by falling in a stope from one level to another. This stope had been closed off, and the deceased crawled over the barricade.

At the Whistle mine, on July 4th, a miner, while helping to hoist powder in a raise was killed by a plank falling from the staging on which his partner was working.

At the Helen mine, on November 11th, a trammer was standing on arched ore over a chute. The chute was blasted, and the man killed by the run of ore.

### Surface Accidents

Eight men were killed in surface accidents during 1913, an increase of two over the preceding year. Of these, three were killed in construction work, extremely cold weather being the cause of the accidents. Two men were electrocuted, in both cases while doing repair work.

At the Moose Mountain mill, on January 30th, an oiler was caught and killed in an unprotected gear while oiling a bearing.

At the Hollinger mill, on April 7th, a filter operator, while throwing on a belt, had his clothing caught on a shaft coupling and was killed.

One man was killed by a loaded tram-car falling on him while he was attempting to replace it on the rails.

### Fuse Troubles

During the year many complaints have been received from the mining companies regarding the quality of the fuse on the market. The fuse trouble seemed to be more acute in the Cobalt camp than elsewhere.

On January 17th, at the Colonial mine, a miner was injured owing to the delayed or slow burning of a fuse. The brand of fuse used is not known.

On February 26th, the Trethewey Silver Cobalt mine reported that on two occasions their miners had narrow escapes from injury due to the quick action of the fuse. White Jacket fuse was the brand used.

On February 20th the Coniagas Mines wrote complaining about the quality of fuse supplied, but did not cite any special instance.

On May 20th at the Hollinger mine, two miners, while lighting a round of holes, noticed one fuse burning quickly and attempted to escape. The explosion occurred while they were crawling over the broken ore near the face. The miner succeeded in crawling out and getting help; he died eight days later in the hospital. His helper was not rescued for about half an hour owing to the gas at the face. He died three hours after being taken to the surface. The inspector who investigated this accident thought the holes might not have been properly tamped; but the miner, a man with several years' experience, swore positively that it was a "quick" fuse. The fuse was Crown brand.

On September 29th at the Crown Reserve mine, two men were leaving the face after lighting eleven holes, when about 100 feet distant, one of the holes exploded, but without injury to either of the men.

The fuse used was Clover brand, with a supposed burning speed of forty seconds to the foot. An investigation of the accident showed the fuse had a burning speed of thirty-two seconds to the foot.

Under date October 23rd, the McKinley-Darragh-Savage mines reported that they had two instances of "quick" fuse during the first week of October.

In the first case the man had lighted all his holes, and, as he was leaving, he noticed that the first hole held a "quick" fuse. He jumped down to the level and got under the timbers just as the hole exploded.

The second case occurred on the same or next day. After the man had lighted several holes he noticed one burning rapidly. He immediately cut this fuse but found that the fire had gone by. He ran out of the stope just as the hole exploded.

In each case "White Jacket" fuse was being used.

Under date October 21st, the Hollinger Gold Mines report as follows:—

On October 16th, two men were lighting holes in an underhand stope in the 100-foot level. The holes were tamped with water. Upon lighting one fuse the fuse flashed. The men were working three or four feet below the level, and when the fuse flashed they jumped on to the level and got about ten feet away before the hole exploded. Both men were knocked down, but aside from being shaken up a little and badly frightened they were not injured. Both men are positive that the fuse "ran." They are equally positive that the holes were tamped with water. Clover brand was the fuse used.

On November 8th at the Hollinger Gold Mines, two men were lighting 18 holes in a stope on the 100-ft. level. The eighteenth hole started to burn quickly. The men ran, and had time to get out of the stope and down to the level before the hole exploded. It took about one minute, as nearly as they could estimate, for the fuse to burn. The fuse was Crown brand.

The Canadian Copper Company, users of Beaver brand fuse, report trouble with this fuse, in that the outer covering seems to be inflammable.

This fuse is manufactured by Noebels Limited, Glasgow, Canadian Explosives Limited being the agents.

The Crown brand fuse is manufactured by William Bennett, Sons & Company Cambourne, Cornwall, England. Leckie & Collis, Limited, Napanee, Ont., are agents

The Clover brand fuse is manufactured by the Ensign-Bickford Manufacturing Company, of Simsbury, Conn. Grodwards Company, Cobalt, are the agents.

White Jacket fuse is manufactured by Bickford, Smith and Company, Tuckerswill, Cornwall, England. Mussens, Limited, Montreal, are agents.



### Prosecutions

Before Magistrate Brodie at Sudbury, an employee of the Creighton mine was fined \$25 and costs for a violation of Rule 31 of the Mining Act. His companion, Louis Pero, left the camp and could not be located. These men were riding on the skip.

Before Magistrate Brodie at Copper Cliff, on November, 22nd, three men were each fined \$20 and costs for being under the influence of liquor at the Creighton mine.

Before Magistrate Atkinson, at Cobalt, on February 7th, the Cobalt Lake Mining Company were fined \$100 and costs for violation of Rule 36, Sec. 164 of the Mining Act of Ontario, in that a closed hook was not used for hoisting, on January 13th.

Before Magistrate Atkinson, at Cobalt, on February 7th, the Right of Way Mining Company were fined \$250 and costs for a violation of Rule 33, Sec. 164 of the Mining Act, the cross-head not being equipped with a proper safety appliance.

Before Magistrate Atkinson, at Cobalt, on February 14th, Emil Niemi, an employee of the Nipissing Mining Company, was fined \$10 and costs for a violation of Rule 46, Sec. 164 of the Mining Act, in ringing the signal bell, he not being the cage tender, and in giving the signal to move the cage when the same was not at the level at which the signal was given.

Before Magistrate Brodie, at Sudbury, on February 20th, The Moose Mountain, Limited, was fined \$100 and costs for a violation of Rule 47, Sec. 164 of the Mining Act of Ontario, in not having geared wheels properly enclosed by a casing on January 30th.

Before Magistrate Hunter, at Kingston, on August 25th, the North American Smelting Company were fined \$100 and costs for an infringement of Rule 5, Sec. 164 of the Mining Act. This company owns the Perth Road Lead mine, and blasting at an air shaft at No. 3 mine was not done by means of an electric current.

Before Magistrate Brodie at Sudbury, on September 29th, the shift boss at the Murray mine was fined \$15 and costs, and the hoistman at the same mine \$20 and costs. These men were guilty of an infringement of Rule 97, Sec. 164 of the Mining Act in that they were intoxicated while on shift.

Before County Magistrate R. R. Casement, at Madoc on October 3rd, the Canadian Sulphur Ore Company were fined \$100 and costs for an infringement of Rule 23, Sec. 164 of the Mining Act. At the pyrite mine of this company, near Queensboro, the main shaft was being continued below the first or 118-foot level. Hoisting from the first level was carried on without making provision for the safety of the men engaged in sinking operations.

Before Justice of the Peace Weston, at Timmins, on May 23rd, a machine runner at the Hollinger gold mine was fined \$10 and costs for drilling into a hole which had previously been blasted.

### Health of Miners

The general health of workmen in the different camps has continued good during the past year. There were very few cases of typhoid in Northern Ontario mining camps.

With regard to miners' phthisis there does not seem to be any change from a year ago. A few cases are known among the older miners. The absence of many known cases among the miners of Ontario does not prove that conditions underground are satisfactory as regards gas and dust, since the accident reports show that seventy per cent. of the men injured in the mining industry of Ontario were under thirty-one years of age. Attempts were made during the past year to lessen the dust from drilling operations by having hammer drills equipped with a water spray. This was not a success, due partly to mechanical defects in the spray itself, and partly to the opposition of the hammer-drill operators. The spray choked up easily, and required considerable care to keep in good working order. The men



objected to this trouble; also to carrying water up raises, stopes, etc., and many complained that the spray wet the operator. As the use of the spray undoubtedly decreases the footage drilled, the foremen and managers probably gave more serious consideration to these objections than they otherwise would have done.

The opinion of those making a study of this subject in South Africa is that the gas and dust from blasting operations is the main cause of phthisis. In this connection the *Rand Daily Mail* published the following in its editorial columns of August 13th, 1913:—

In the recently published interim report of the Miners' Phthisis Prevention Committee, special emphasis was laid upon the dangerous nature of the dust caused by blasting operations underground. In the first place it was shown that after general blasting an unusually large amount of dust was present in the air. In the second place it was "provisionally stated" that the dust originated by blasting "most closely resembles the dust incarcerated in the silicotic lung." It is obvious, therefore, that any system which can keep men out of the mines during, and after, blasting, must be of value in helping to safeguard them against the scourge of the Reef. Some time ago we strongly urged the introduction of the plan of blasting by electricity from the surface. Evidence was given of the success of this method in the Witbank collieries, and Mr. E. J. Moynihan, who is an authority on mining matters, supported the suggestion in several practical letters. To-day we are able to announce that an important experiment has been planned by the management of the Albu group. The heads of the group have all along taken a keen personal interest in the question, and it has been decided to equip the Meyer and Charlton mine with the fittings necessary for using the general blast by electricity.

The report of the Phthisis Committee disclosed the small amount of success achieved by many of the expedients now in force for reducing the amount of dust in the atmosphere underground. It was made plain that drastic action is essential for the protection of the workers. The elimination of present-day blasting methods seems to be an important factor in the obtaining of better conditions, and the general blast by electricity controlled from the surface offers one solution of a difficult problem.

Under the date of September 4th, 1913, Mr. Moynihan states that the experiments at the Meyer and Charlton mine were so satisfactory that it was the intention of the management to adopt this system throughout the whole mine.

The following quotations from the Report of the Mining Regulation Commission of the Transvaal show the prevalence of miner's phthisis and the means recommended to mitigate the evil:—

It is well known that persons such as cutlers, potters, quarrymen, filemakers, felt hat finishers, lead and tin miners, who are more or less continuously inhaling hard, sharp, irritating dust, show an undue mortality from respiratory disease after the age of about 35. Naturally this is less marked in the case of open-air workers such as quarrymen than in men who work underground or in cover. On the other hand, in the case of rock-drillers, this mortality begins much earlier and is much heavier. From the reports of the Transvaal Government Mining Engineer for 1901 and 1902 (quoted by Dr. Haldane) it appears that between October, 1899, and January, 1902, the war being in progress and mining operations practically suspended, the annual death rate among the men who had been employed in the Transvaal as rock-drillers before the war was no less than 73 per 1,000, and this during a period when the great majority were not actually engaged in rock-drill work. The corresponding figure for Cornish rock-drillers is estimated by Dr. Haldane at about 60 per 1,000; while the Victorian statistics, published by Dr. Summons, indicate that in the Bendigo mines the mortality is higher even than in the Transvaal. The disease has consequently been the subject of careful official inquiry in all these localities, viz., in the Transvaal by the Miners' Commission of 1902-03; in Cornwall by Dr. Haldane, with Messrs. Martin and Thomas, who reported in 1905 "On the Health of Cornish Miners"; in Australia by the Commission of 1905 "On the Ventilation and Sanitation of Mines in Western Australia," as well as by Dr. Walter Summons who in 1907 published an excellent and illuminating report on miner's phthisis at Bendigo, Victoria. In each of these localities miner's phthisis has very greatly increased since the general introduction of rock-drills into practice, and those who have investigated the matter are generally agreed as to the nature of the disease, which is thus summarized by Drs. Irvine and Macaulay:—

"It is primarily a chronic disease of the lungs, characterized by slow but progressive fibroid changes in the lung tissue and the pleuræ, accompanied by chronic catarrhal processes in the air-cells and respiratory passages. All are agreed that immensely the most important factor in producing this condition is the more or less continuous inhalation over long periods of fine rock-dust. All true cases of miner's phthisis are thus primarily cases of silicosis; silicosis is the feature common to them all. Finally, it is agreed that, in the later stages, tuberculous infection commonly, or invariably, becomes super-imposed upon this condition, and the symptoms and course of the disease alter accordingly."

**Duration of the Disease.**—From the evidence before us it appears that, in the past, the average age at death of rock-drillers dying from silicosis in the Transvaal was thirty-five years, and the average period of rock-drill employment was seven to nine years. Dr. Haldane gives the following figures for rock-drillers dying in Cornwall:—

Where work has been done	Average Age at Death in 142 cases	Average Period of Rock- drill Employment when ascertainable
Cornwall only .....	37.5	8.4
Cornwall and Transvaal.....	36.4	4.7
Transvaal only.....	36.3	11.6

During 1905-7 the average age of mine employees dying of phthisis on the Rand was 39 years. At Bendigo, the incidence of the disease is, as already pointed out, considerably heavier than on the Rand, but the average age at death is much higher than here, viz., year by year just under or above fifty years, the presumption being that the development of silicosis is much more gradual and the Bendigo miner's term of active usefulness correspondingly longer.

**Preventive Measures.**—From the foregoing considerations it is clear that our efforts must be directed to

1. The prevention of dust inhalation;
2. The prevention or removal of noxious fumes resulting from explosives;
3. The prevention of tuberculosis.

(1) **The Prevention of Dust Inhalation.**—The rock-driller is far more exposed to dust than any other miner. This dust is produced (a) by drilling dry holes and (b) by blasting. In dry working places it is raised again after its subsidence (a) by the air escaping from the rock-drills and (b) by the lashing or shovelling of broken rock which is not wet. Holes drilled from above downwards are usually kept filled with water, and, as work progresses, exude only mud; "backholes," or holes drilled from below upwards, will obviously not retain water, and unless a jet or spray be played upon them, give off a continuous stream of fine dust. The chief occasions of dust inhalation are therefore (a) when the escaping air from the rock-drills raises the dust from the floor and sides of dry working places; (b) in drilling backholes; (c) on returning to the working face after blasting before the dust has had time to subside; and (d) in lashing without keeping the rock thoroughly wet.

### Ventilation of Mines

During the year only two deaths resulted from gas poisoning; in both cases the fatality would not have occurred could rescuers have reached the men sooner. Pulmometers are now installed at the following places: Hollinger mine, 1; Dome Hospital, 1; Cobalt Mines Hospital, 1; Canadian Copper Company, Copper Cliff, 5; The Steel Company of Canada, Hamilton, 1; Algoma Steel Corporation, Sault Ste. Marie, 2.

Assistant Inspector of Mines Collins writes as follows regarding the use of the pulmotor at the plant of The Steel Company of Canada:

I wish to bring to your attention the following cases of resuscitation by the use of the pulmotor reported by Sergeant Matthews, in charge of the first aid dispensary, The Steel Company of Canada's plant, Hamilton, Ont.:—

A. Walker was overcome by gas at the blast furnace on March 3rd last and carried into the dispensary unconscious. His pulse was very weak, and it was apparent that he had inhaled a large volume of gas and could not throw it off. Mr. Matthews used the pulmotor continuously for fifteen minutes and natural breathing was restored. In a short time he was able to resume work.

Filis Bausch was overcome by gas at the open-hearth plant on April 17th. When brought to the dispensary he was bleeding at nose and mouth and no pulse could be detected. Mr. Matthews was able to start natural breathing by fifteen minutes' treatment with pulmotor, and at the end of one hour and a quarter Bausch was able to walk home, being afterwards treated at the hospital.

Mr. Matthews is an expert first aid man, and informed the writer that both cases were extremely bad, and would undoubtedly have ended fatally had it not been for the pulmotor treatment.

The necessity of a pulmotor in cases of electric shock is shown in the following letter from the city of Port Arthur, dated November 12th, 1913:—

We have just had an opportunity this morning of demonstrating the pulmotor to be installed in the Hydro-Electric Power Commission's sub-station, this city. One of the linemen came in contact with a high-tension wire, one side of a 23,000 volt line, and was completely knocked out when the pulmotor was applied, and we had him breathing normally when the doctor arrived. We think that this was the means of saving this man's life. The man is now in the hospital and apparently doing all right.

### Treatment of Gassing

1. Every case of gassing should be at once reported to the shift boss and by him to the mine manager either directly or through the mine captain.

2. All cases of gassing should be brought to the fresh air as quickly as practicable, and kept warm by the application of warm clothing and other external means. The common practice of sousing such cases externally with cold water and of administering whiskey or brandy internally should on no account be employed, because of the physiological shock produced.

3. If the sufferer can swallow, an emetic (one ounce of sulphate of zinc solution, strength 30 grains to ounce) should be at once given, and repeated every ten minutes till vomiting results.

4. When vomiting has occurred, a dose of two teaspoonfuls in water of aromatic spirits of ammonia (sal volatile) should be administered.

5. Artificial respiration should be started and continued as long as there is any indication of life, the patient thereby being made to inhale oxygen through a mask. Oxygen in such cases is invaluable; carbon monoxide is eliminated five times as rapidly in an atmosphere of oxygen as in air, and in nitrous fumes poisoning the beneficial effect of oxygen on the terrible distress of pulmonary oedema is most marked.

In the latter treatment of nitrous fumes gassing, the medical attendant may have to resort to saline transfusion and liberal blood-letting.

6. All cases of gassing, however slight, should be kept under medical observation for at least twelve hours.

We therefore submit the following recommendations:—

(a) That the legal maximum for noxious  $\text{CO}_2$  permissible in mines in the Transvaal be fixed at 8 parts by volume in 10,000 of air.

(b) That an amount of 4 parts of  $\text{CO}_2$  by volume in 10,000 of air shall be allowed in addition to the aforesaid maximum as representing innocuous  $\text{CO}_2$  normally present in the atmosphere.

(c) That where candles or similar illuminants are in use, a further addition of 3 parts of  $\text{CO}_2$  by volume in 10,000 of air shall be allowed as representing innocuous  $\text{CO}_2$  resulting from the combustion of such illuminants.

(d) That in order to meet, from the point of view of practical administration, difficulties in regard to possible innocuous  $\text{CO}_2$  from country rock and other uncertain sources in the mines of the Rand, a further allowance of 5 parts per 10,000 be made, making a total limit of 20 parts per 10,000 of air. That in view of the extremely poisonous effects of carbon monoxide and nitrous fumes on the human system, and the frequency of gassing fatalities on the Rand, we also recommend that the maximum permissible amount of carbon monoxide in any part of a mine shall not exceed .01 per cent., and no practically determinable amount of nitrous fumes shall be permitted in any part of a mine.



### Mine Hospitals

The last annual report of the Hospital Board of the Cobalt Mines Hospital for the year ending February 28, 1913, notes that additional surgical and X-ray appliances were added to the surgical department; that sun parlors and verandahs were added to the building; and that over \$2,000 were spent in beautifying the grounds.

Patients in Hospital March 1st, 1912 .....	9	
Patients admitted during year .....	447	
		456
Patients discharged during year:—		
Deaths . . . . .	11	
Recovered . . . . .	422	
		433
Patients in Hospital March 1st, 1913 .....	23	
Average patients per day in Hospital .....	18.4	
Average days per patient in Hospital .....	14.7	

	Deaths	Per cent. Deaths	Per cent. Recovery
Pneumonia .....	2	15	85
Cancer .....	1		
Convulsions .....	1		
Spinal Meningitis .....	1		
Typhoid .....	1	14.3	85.7
Accidents .....	5	3.2	96.8
Medical cases .....	6	3.3	96.7
Surgical cases .....	5	1.85	98.15
Total cases .....	11	2.46	97.54

The new hospital at Copper Cliff being built by the Canadian Copper Company at a cost, when equipped, of \$250,000, is expected to be ready for occupancy by February 15th, 1914.

The building is two storeys, with basement and sub-basement, and is fireproof throughout, being constructed of reinforced concrete and tile, with tile floors and slate shingles.

The main building is 191 feet by 36 feet, with a 73-foot by 55-foot wing.

On the ground floor are the doctors' and head nurse's offices, surgical ward, two typhoid wards, four private wards, bathrooms, closets, medicine room, dispensary and drug room, X-ray room, dark room and operating room; also kitchen, dining room, etc. There are two sun parlors, 34 feet by 13 feet, one on each end of the main building.

On the second floor there are five private wards, one semi-private ward, electrical kitchen, bathrooms, doctors' bedrooms and sitting-rooms, linen and sewing rooms, and balcony.

The basement has ten rooms fitted up for the help, bathrooms, laundry and dry room; also a morgue and post-mortem room.

The sub-basement contains the heating plant and an ice-making plant.

There are two well-equipped hospitals in Porcupine, one at the Dome in charge of Dr. McNeil and the other at Timmins in charge of Dr. Moore.



### Labor

During the first part of the year there was a scarcity of labour in the mining camps. In the latter part of the year there was an excess of unskilled labour. Good miners can always obtain employment in any of the Northern Ontario mining camps. The Porcupine strike was allowed to lapse in the early part of the summer; there has been no other labour disturbance during the past year.

On January 1st, 1914, the Eight-hour Act came in force in the majority of the mines of Ontario. This Act calls for eight hours from face to face. In Cobalt and Porcupine the majority of the mines are working two eight-hour shifts. In Sudbury the general practice is to employ three shifts of eight hours each. The mines of Eastern Ontario and the iron mines in operation last year are exempted, although the Moose Mountain iron mines are employing two shifts of nine hours from change room to change room.

Table of Fatal Accidents in

No.	Date 1913	Name of Mine.	Name of Owner.	Name of Deceased.	Occupation of Deceased.
1	Sept. 1	Magpie.....	Algoma Steel Corporn..	Luigi Del Favero.	Drill runner..
2	Nov. 11	Helen.....	do do	L. Pecile.....	Trammer.....
3	Jan. 5	Creighton.....	Canadian Copper Co..	L. Dishno.....	Powderman...
4	" 15	Creighton.....	do do	M. Wazniz.....	Trammer.....
5	Feb. 15	No. 3.....	do do	C. Wadsworth...	Laborer.....
6	May 26	Creighton.....	do do	J. Maki.....	Chute tender..
7	June 3	Crean Hill.....	do do	A. Johnson.....	Pipe fitter....
8	July 7	Creighton.....	do do	T. Serefini.....	Trammer.....
9	Oct. 28	do .....	do do	E. Vinzelli.....	Lamp tender..
10	Dec. 9	do .....	do do	A. Dylej.....	Chute tender..
11	July 14	Long Lake.....	Canadian Exploration Co., Ltd. ....	P. Grabowski....	Skip tender...
12	Feb. 22	Alexandra.....	Canadian Gold and Silver Mining Co. ....	Thos. McAndrews	Trammer.....
13	" 18	Cobalt Lake .....	Cobalt Lake Mining Co.	Nikola Gaiena...	Trammer.....
14	Mar. 26	Cobalt Townsite..	Cobalt Townsite Mining Co. ....	P. Sjkovist.....	Drill runner...
15	Aug. 23	Coniagas.....	Coniagas Mines, Ltd..	S. Brigden.....	Drill runner...
	" 23	Coniagas.....	Coniagas Mines, Ltd..	V. Laiho.....	Drill helper...
16	Mar. 17	Henderson.....	Cross and Wellington..	Fred Rogers.....	Trammer.....
	" 17	Henderson.....	Cross and Wellington..	Stephen Milan...	Trammer.....
17	July 4	Whistle.....	Dominion Nickel Copper Co. ....	P. Lichvazuk....	Drill runner...
18	Ap'l 17	Hollinger.....	Hollinger Gold Mines, Ltd. ....	E. Eudier.....	Millman.....
19	May 20	do .....	do do	A. Gino.....	Drill helper...
	" 20	do .....	do do	M. Gabbro.....	Drill runner...
20	Aug. 26	Hollinger Reserve	Hollinger Reserve Mining Co. ....	J. Nolan.....	Drill runner...
	" 26	do .....	do do	M. Tereske.....	Deckhand.....
21	Jan. 8	McIntyre.....	McIntyre Porcupine Mines, Ltd. ....	R. E. Dube.....	Carpenter.....
	" 8	McIntyre.....	do do	O. Charon.....	Carpenter.....
22	" 14	Garson.....	Mond Nickel Co.....	O. Malynk.....	Trammer.....
23	" 20	Frood Extension..	do .....	W. Norme.....	Drill runner...
24	Mar. 14	Garson.....	do .....	Biglig Urin.....	Drill runner...
25	May 29	Victoria.....	do .....	G. Pednud.....	Trammer.....
26	Aug. 29	Frood Extension..	do .....	J. Knaapi.....	Drill runner...
27	Oct. 9	Garson.....	do .....	W. Lazovowitz...	Trammer.....
28	Jan. 30	Moose Mountain..	Moose Mountain, Ltd..	J. McGregor.....	Oiler.....
29	July 1	Moose Mountain..	Moose Mountain, Ltd..	E. Yarvil.....	Drill runner...
30	Jan. 15	Nipissing.....	Nipissing Mining Co..	A. Lefebre.....	Cage tender...
31	Feb. 16	do .....	do do	J. McGoff.....	Drill runner...
32	Aug. 22	do .....	do do	F. Guiseppi.....	Trammer.....
33	Mar. 4	North Dome.....	North Dome Mining Co. ....	N. Carlos.....	Drill runner...
34	" 20	North Dome.....	do do	S. Musmici.....	Drill helper...
35	Jan. 8	Right of Way.....	Right of Way Mining Co. ....	J. Colterman....	Drill runner...
36	Mar. 25	Temiskaming.....	Temiskaming Min'g Co.	J. Koniadina....	Trammer.....
37	July 22	Temiskaming.....	Temiskaming Min'g Co.	G. Montgomery...	Electrician...
38	Feb. 20	Hudson Bay.....	Temiskaming & Hudson Bay Mining Co. ....	W. McGuiness...	Drill runner...
	" 20	do .....	do do	D. McNair.....	Drill helper...
39	May 20	do .....	do do	E. Poisson.....	Drill helper...

## or about the Mines, 1913.

Nationality of Deceased.	Age	Married or single	Above ground	Below ground	Cause of Accident.
Italian.....	27	S	.....	1	Premature explosion in raise.
Italian.....	26	S	.....	1	Standing on arched ore in raise. Ore settled, smothering him.
English-speaking....	25	S	.....	1	Fell off skip and fractured skull.
Pole.....	35	M	.....	1	Skull fractured by piece of falling ice.
English-speaking....	26	S	1	.....	Fell fifteen feet from platform and broke neck.
Finn.....	26	M	.....	1	Crawled into chute, caught by fall of ore.
Finn.....	26	M	1	.....	Electrocuted in pumphouse.
Pole.....	25	M	.....	1	Crushed between two cars on fifth level.
Italian.....	21	S	.....	1	Jumped from moving skip at fourth level.
Pole.....	37	M	.....	1	Crushed on fifth level when pillars caved.
Pole.....	30	S	.....	1	Killed while attempting to ride skip.
English-speaking....	30	S	.....	1	Struck by falling crosshead.
Pole.....	28	M	.....	1	Attempted to board moving cage.
Swede.....	35	M	.....	1	Premature explosion, while lighting holes.
English-speaking....	30	M	.....	1}	Explosion of dynamite in stope, cause unknown.
Finn.....	24	S	.....	1}	
English-speaking....	35	M	.....	1}	Crushed by falling ground.
English-speaking....	26	S	.....	1}	
Pole.....	37	M	.....	1	Killed in raise by falling plank.
French.....	20	S	1	.....	Clothing caught in shafting.
Austrian.....	32	M	.....	1}	Premature explosion while lighting holes.
Austrian.....	29	M	.....	1}	Died May 28th.
English-speaking....	22	S	.....	1}	Premature explosion while removing tamping from missed holes with iron scraper.
Pole.....	25	S	.....	1}	
English-speaking....	22	M	1	....}	Chord of roof truss of new mill broke. Fell fifty feet. Died January 24th.
English-speaking....	20	S	1	....}	
Pole.....	28	S	.....	1	Struck by falling ground while scaling.
Finn.....	23	S	.....	1	Struck by piece of falling plank.
Austrian.....	26	M	.....	1	Crushed by rock rolling down stope.
Austrian.....	32	M	.....	1	Fell in stope from ninth to tenth level.
Finn.....	24	S	.....	1	Cable broke, struck by falling bucket.
Austrian.....	35	M	.....	1	Starting mill hole, was carried down with ore.
English-speaking....	40	M	1	.....	Clothing caught in revolving gear.
Finn.....	35	M	.....	1	Drilled into explosive.
English-speaking....	28	M	.....	1	Fell in shaft from cage while unloading steel.
English-speaking....	34	S	.....	1	Staging gave way while timbering in winze.
Italian.....	37	M	1	.....	Crushed by loaded car while trying to replace car on track.
Italian.....	35	M	.....	1	Asphyxiated while relighting holes.
Italian.....	35	M	.....	1	Drilled into missed hole.
English-speaking....	25	S	.....	1	Struck by falling crosshead.
Austrian.....	32	M	.....	1	Crushed by fall of ground.
English-speaking....	19	S	1	.....	Electrocuted while replacing telephone line on high tension line.
English-speaking....	61	M	.....	1}	Started drilling into old bottom.
English-speaking....	30	S	.....	1}	
English-speaking....	22	S	.....	1	Drilled into cut-off hole.
TOTALS..			8	37	

Table of Non-Fatal Accidents

No.	Date of Accident.	Date of Recovery.	Name of Mine.	Name of Owner.	Name of Injured.	Occupation of Injured.
1	Sept. 17	Dec. 29	The Alabastine Co.,	The Alabastine Co., Ltd.	Jas. Perkins.....	Drill helper
2	Nov. 17	" 15	do	do do	E. Aaron.....	Laborer.....
3	" 29	Jan. 5	do	do do	G. Carpenter.....	Teamster.....
4	Jan. 25	Feb. 8	Magpie.....	Algoma Steel Corporn.	P. Conigle.....	Trammer.....
5	May 19	June 2	do	do do	O. Hulkkanen.....	Drill runner..
6	" 24	May 31	do	do do	B. Vincenzo.....	Trammer.....
7	" 18	June 2	do	do do	A. Garrepy.....	Painter.....
8	July 4	July 20	Helen.....	do do	W. Matheson.....	Blacksmith....
9	Aug. 1	Aug. 11	do	do do	J. Berich.....	Trammer.....
10	" 13	" 22	Magpie.....	do do	S. Chowanski....	Crusherman...
11	Sept. 15	Oct. 9	Helen.....	do do	Guisepe de Meio	Blacksmith's helper.....
12	Oct. 6	" 20	do	do do	J. Borich.....	do
13	" 14	Nov. 3	do	do do	J. Trtanz.....	Drill runner...
14	Nov. 19	" 27	do	do do	A. De Zordo.....	Drill runner...
15	Dec. 7	Dec. 15	Magpie.....	do do	R. Muscatello....	Laborer.....
16	Sept. 17	Nov. 14	Bailey.....	Bailey Cobalt Mines, Ltd.	A. Moitemise.....	Trammer.....
17	Nov. 10	" 22	Beaver.....	Beaver Con. Mines, Ltd.	J. Swajozike.....	Deckman.....
18	Feb. 21	Mar. 25	Buffalo.....	Buffalo Mines, Ltd.....	P. Troutman.....	Trammer.....
19	Apr'l 21	.....	do	do do	J. R. Hawley....	Carpenter.....
20	Sept. 19	Nov. 15	do	do do	H. Nichol.....	Carpenter.....
21	Dec. 4	Dec. 17	do	do do	P. B. Johnson....	Millman.....
22	" 22	.....	do	do do	J. Kasparak.....	Trammer.....
23	July 2	.....	Bessemer...	Canada Iron Mines, Ltd.	R. Haggarty.....	Drill runner...
24	Jan. 4	Feb. 5	No. 2.....	Canadian Copper Co..	Victor Jairainen..	Chute blaster..
25	" 4	Jan. 20	Creighton..	do do	Otto Malinere....	Drill runner...
26	" 5	Mar. 5	do	do do	J. W. Brown.....	Level boss....
27	" 5	Feb. 17	do	do do	Waino Wista.....	Drill helper...
28	" 9	Jan. 18	do	do do	Robt. Saari.....	Drill helper...
29	" 10	Feb. 24	do	do do	Mytro Stalmuk....	Trammer.....
30	" 15	" 7	No. 3.....	do do	C. D. Crawford....	Trammer boss
31	" 16	" 3	Creighton..	do do	C. Nachoff.....	Trammer.....
32	" 19	Jan. 29	do	do do	W. Turnbull.....	Timberman....
33	" 20	Feb. 3	do	do do	J. Maanpaa.....	Drill runner...
34	" 20	Jan. 28	do	do do	O. Obumsaloim....	Drill runner...
35	" 21	Feb. 6	No. 2.....	do do	Frank Stone.....	Trammer.....
36	" 24	" 10	Creighton..	do do	Geo. Mattson.....	Drill runner..
37	" 24	Mar. 3	do	do do	G. Spranka.....	Drill runner..
38	" 26	Feb. 25	do	do do	J. Maki.....	Drill runner..
39	" 27	" 17	do	do do	Ivan Station.....	Trammer.....
40	" 30	" 26	do	do do	Jas. Cmejnteniz..	Trammer.....
41	Feb. 1	" 25	Crean Hill..	do do	Donald McDonald	Shift boss.....
42	" 1	Mar. 11	Creighton..	do do	Jas. Hughes.....	Timberman....
43	" 2	Feb. 25	do	do do	Geo. Waloshuk....	Drill helper...
44	" 4	" 14	do	do do	C. Virginio.....	Laborer.....
45	" 7	" 15	Crean Hill..	do do	F. J. Baker.....	Mechanic.....
46	" 8	Apr. 8	Creighton..	do do	C. Blanchard.....	Drill runner..
47	" 8	Feb. 19	do	do do	Peter Smith.....	Trammer.....



## in or about Mines, 1913.

Nationality of Injured.	Age.	Married or single.	Below ground.	Above ground.	Nature and Cause of Accident.
English-speaking....	42	M	1	.....	Injured leg while barring rock from face.
English-speaking....	35	M	.....	1	Knocked off top of car in yard and injured hip.
English-speaking....	23	S	1	.....	While riding on loaded car had leg caught between loaded car and empty at switch.
Italian.....	19	S	1	.....	Pulling tramcar and foot caught by flange of wheel.
Swede.....	26	.....	1	.....	While tightening nut on machine, slipped and fell into stope.
Italian.....	24	.....	1	.....	Foot bruised by rock falling out of chute.
Italian.....	24	.....	.....	1	Hand crushed against iron girder.
English-speaking....	23	.....	.....	1	Fell while carrying drill machine and broke ankle.
Pole.....	24	.....	1	.....	Car ran over finger.
Russian.....	21	S	.....	1	Clothing caught in flywheel of sample crusher and three ribs broken.
Italian.....	31	.....	.....	1	Dropped piece of iron on foot.
Pole.....	25	.....	.....	1	Struck thumb with hammer.
Finn.....	30	.....	1	.....	Large piece of clay rolled against ankle.
Italian.....	26	.....	1	.....	Piece of rock fell on head.
Italian.....	20	.....	.....	1	Slipped off plank and sprained ankle.
Italian.....	.....	.....	1	.....	Hand injured at chute.
Russian.....	.....	.....	.....	1	Went over end of dump with car.
Pole.....	45	M	1	.....	Struck on head by steel falling down unused shaft.
English-speaking....	30	M	.....	1	Fingers caught in planer.
English-speaking....	30	M	.....	1	Ankle sprained and right arm broken when jumped from staging.
English-speaking....	45	M	.....	1	Wrench slipped and hit him over eye.
Pole.....	35	M	1	.....	Thumb broken while loading car at chute.
English-speaking....	24	S	1	.....	Rock fell on foot.
Finn.....	30	S	1	.....	Rock fell down chute, injuring hand.
Finn.....	29	M	1	.....	Drill fell on him as he was pulling it down.
English-speaking....	29	M	1	.....	Hand amputated, fell from skip while riding.
Finn.....	23	S	1	.....	Scalp cut by piece of falling ice.
Finn.....	39	M	1	.....	Arm bruised by drill falling on it.
Pole.....	33	S	1	.....	Wrist bruised, caught between car and door.
English-speaking....	23	S	1	.....	Fell into sump and injured knee.
Bulgarian.....	27	S	1	.....	Finger jammed while dumping car in skip.
English-speaking....	37	S	1	.....	Head cut, struck by chute gate.
Finn.....	23	S	1	.....	Back cut, struck with rock from blast.
English-speaking....	22	S	1	.....	Drill fell on foot, injuring same.
Finn.....	25	S	.....	1	Struck on foot by hammer.
Finn.....	32	S	1	.....	Fell over end of dry wall and injured his side.
Pole.....	32	S	1	.....	Finger jammed between tripod and rock.
Finn.....	23	S	1	.....	Drill fell on hand, crushing second finger.
Pole.....	28	S	1	.....	Thumb crushed between car and chute gate.
Pole.....	30	M	1	.....	Rock rolled down pile and bruised ankle.
English-speaking....	39	M	1	.....	Slipped on ladder and bruised knee.
English-speaking....	28	S	1	.....	Finger crushed under piece of timber.
Pole.....	23	S	1	.....	Face cut by piece of falling rock.
Italian.....	25	S	1	.....	Head cut by small piece of rock falling from chute.
English-speaking....	35	M	1	.....	Oiling valve with coal oil, which ignited, and burned face.
English-speaking....	24	S	1	.....	Ankle cut by piece of rock sliding off bench.
Pole.....	23	S	1	.....	Bolt of car struck him on knee.

Table of Non-Fatal Accidents

No.	Date of Accident.	Date of Recovery.	Name of Mine.	Name of Owner.	Name of Injured.	Occupation of Injured.
48	Feb. 8	Feb. 19	No. 2.....	Canadian Copper Co. .	T. Eralla.....	Trammer.....
49	" 9	" 21	Creighton..	do do	Victor Piri.....	Drill runner..
50	" 9	Mar. 13	do ..	do do	J. Modiste.....	Trammer.....
51	" 10	Feb. 25	No. 2.....	do do	Ed. MacKinnon..	Chute blaster.
52	" 11	May 12	Creighton..	do do	S. Pesqual.....	Skip tender...
53	" 11	Mar. 17	do ..	do do	F. Karpinski....	Trammer.....
54	" 16	" 2	No. 3.....	do do	A. Avicksonin...	Drill runner..
55	" 18	Feb. 28	Creighton..	do do	K. Hanitenan...	Drill helper...
56	" 19	Mar. 4	Crean Hill.	do do	M. Dolvowolski.	Crusherman...
57	Mar. 1	Apr. 15	Crean Hill.	do do	Jas. Lindella....	Drill helper...
58	" 1	Mar. 10	Creighton..	do do	S. Aatanasoff....	Trammer.....
59	" 5	" 13	No. 3.....	do do	S. Guiseppi.....	Laborer.....
60	" 5	" 26	Crean Hill.	do do	Geo. Seymour....	Drill runner...
61	" 5	" 19	No. 3.....	do do	L. Dececkio.....	Drill helper...
62	" 6	" 20	Crean Hill.	do do	M. Mazowick....	Trammer.....
63	" 9	" 24	Creighton..	do do	G. Calendoni....	Straw boss...
64	" 10	" 24	No. 2.....	do do	L. Holamas.....	Trammer.....
65	" 12	" 20	No. 2.....	do do	Elmer Johnson..	Drill runner..
66	" 14	June 26	Creighton..	do do	Karl Bossell....	Drill runner..
67	" 14	Apr. 8	No. 2.....	do do	Emil Kantamaki.	Drill runner..
68	" 17	Mar. 27	No. 2.....	do do	Sam Wuori.....	Drill helper...
69	" 18	Apr. 2	No. 3.....	do do	F. Ranislo.....	Laborer.....
70	" 20	May 21	Creighton..	do do	W. Rahkala.....	Drill helper...
71	" 20	Apr. 1	No. 2.....	do do	Alex. Rantenan..	Trammer.....
72	" 24	" 3	No. 2.....	do do	John Smith.....	Drill helper...
73	" 26	" 4	Creighton..	do do	W. G. Shute.....	Fitter.....
74	" 31	June 10	do ..	do do	F. Bosmavinuk...	Trammer.....
75	Apr. 1	Apr. 22	Crean Hill.	do do	Mike Krazy.....	Trammer.....
76	" 1	" 10	No. 3.....	do do	W. Maki.....	Drill runner...
77	" 4	" 12	Creighton..	do do	Wryc Monyez....	Ore sorter.....
78	" 7	" 22	do ..	do do	E. Saari.....	Drill helper...
79	" 8	" 17	No. 2.....	do do	J. Westerpacka..	Trammer.....
80	" 9	June 26	Creighton..	do do	N. Korpi.....	Drill runner...
81	" 13	Aug. 4	do ..	do do	E. Creitzman....	Machinist.....
82	" 14	May 14	do ..	do do	L. Dunkovictaki.	Trammer.....
83	" 14	" 1	No. 2.....	do do	A. Bulki.....	Drill helper...
84	" 15	Apr. 23	Creighton..	do do	B. Toderico.....	Trammer.....
85	" 17	May 5	Crean Hill.	do do	W. Linn.....	Drill helper...
86	" 18	Apr. 30	No. 2.....	do do	J. Lormy.....	Skip tender...
87	" 21	May 6	Creighton..	do do	O. Szczech.....	Trammer.....
88	" 22	" 5	No. 2.....	do do	A. Bartollotti...	Trammer boss.
89	" 30	" 20	Creighton..	do do	M. Soczuk.....	Drill helper...
90	May 1	" 12	Creighton..	do do	J. Servioni.....	Trammer.....
91	" 2	July 25	do ..	do do	D. Coaston.....	Trammer.....
92	" 2	May 13	No. 3.....	do do	C. Giovanni.....	Carpenter.....
93	" 3	" 14	Crean Hill.	do do	G. Hill.....	Drill runner...
94	" 3	" 17	do ..	do do	M. Paanamamen..	Drill helper...
95	" 3	" 28	do ..	do do	P. Bardyk.....	Drill helper...
96	" 5	" 13	No. 2.....	do do	P. Masalin.....	Trammer.....

## in or about Mines, 1913—Continued

Nationality of Injured.	Age.	Married or single.	Below ground.	Above ground.	Nature and cause of accident.
Italian.....	37	S	.....	1	Fell down steps and broke arm.
Italian.....	27	S	1	.....	Stopping drill fell and struck him on head.
Italian.....	37	S	.....	1	Fell down steps and broke arm.
Finn.....	23	M	1	.....	Piece of ore fell from car, crushing foot.
Italian.....	47	M	1	.....	Hand caught between car and skip.
Pole.....	25	S	1	.....	Finger cut off in chute air lift.
Finn.....	23	S	1	.....	Timber fell on finger while timbering shaft.
Finn.....	20	S	1	.....	Finger pinched between drill and rock.
Pole.....	28	M	.....	1	Finger crushed under rock while feeding crusher.
Finn.....	22	S	1	.....	Fell off bench in stope and fractured skull.
Bulgarian.....	21	S	1	.....	Leg cut by piece of ore rolling down stope.
Italian.....	22	S	.....	1	Fingers pinched while helping to move hoist.
English-speaking.....	26	S	1	.....	Fell off bench in stope and sprained ankle.
Italian.....	29	S	1	.....	Finger cut by piece of steel falling against him.
Pole.....	24	S	1	.....	Finger cut between rock and side of car.
Italian.....	28	M	.....	1	Toggle plate of crusher fell on his foot.
Finn.....	21	S	1	.....	Fell about twelve feet in ladderway and injured hip.
Finn.....	22	S	1	.....	Head cut by small piece of rock falling from chute.
Pole.....	30	.....	1	.....	Leg broken by falling rock while scaling.
Finn.....	27	.....	1	.....	Loaded car struck foot, bruising same.
Finn.....	22	S	1	.....	Steel fell, injuring hip.
Finn.....	24	S	.....	1	Finger jammed while moving machinery.
Finn.....	22	S	1	.....	Scalp cut by falling off dry wall.
Finn.....	25	S	1	.....	Foot caught in frog and jammed by car.
English-speaking.....	32	S	.....	1	Slipped on ice and cut hand.
English-speaking.....	30	S	.....	1	Bruised by fall of sixteen feet from pipe line.
Pole.....	22	S	1	.....	Foot bruised by car running over it.
Pole.....	22	S	1	.....	Toe crushed by rock falling from chute.
Finn.....	24	S	1	.....	Piece of steel fell on hand.
Pole.....	19	S	.....	1	Fell fifteen feet off stairway and sprained wrist.
Finn.....	23	S	1	.....	Used carbide can for carrying water; face burned by explosion.
Finn.....	23	S	1	.....	Piece of ore fell from chute, injuring hand.
Finn.....	24	S	1	.....	Fell into chute and broke leg.
Russian.....	43	M	1	.....	Pump overbalanced while moving and broke leg.
Pole.....	35	S	1	.....	Squeezed between car and dry wall.
Finn.....	22	S	1	.....	Finger jammed between machine and tripod.
Italian.....	33	M	1	.....	Broken shovel handle injured hand.
Finn.....	21	S	1	.....	Ankle sprained by piece of ore rolling down pile.
Finn.....	30	S	1	.....	While loading car, piece of ore fell, breaking toe.
Pole.....	23	S	1	.....	Foot bruised by piece of ore falling from chute.
Italian.....	30	S	1	.....	Foot bruised by piece of ore falling off car.
Pole.....	21	S	1	.....	Finger bruised while scaling.
Italian.....	28	M	1	.....	Leg bruised by machine bar falling.
Italian.....	23	M	1	.....	Finger bruised at chute.
Italian.....	26	S	.....	1	Foot injured by stepping on nail.
Finn.....	24	S	1	.....	Body bruised by rock rolling down stope.
Finn.....	30	S	1	.....	Body bruised by rock rolling down stope.
Austrian.....	24	S	1	.....	Finger crushed by rock falling down stope.
Finn.....	23	S	1	.....	Back bruised by piece of ore rolling down stope.

Table of Non-Fatal Accidents in

No.	Date of Accident.		Date of Recovery.		Name of Mine.	Name of Owner.		Name of Injured.	Occupation of Injured.
97	May	5	May	29	No. 2.....	Canadian Copper Co...	A. Salo.....	Trammer....	
98	"	5	"	27	Creighton..	do do	A. Bassett.....	Drill helper...	
99	"	6	"	28	do ..	do do	M. Bilenas.....	Chute blaster..	
100	"	17	"	26	Creighton..	do do	J. Sellampaa....	Drill runner...	
101	"	17	July	3	Crean Hill..	do do	J. Barscon.....	Drill runner...	
102	"	20	June	1	Creighton..	do do	N. Yinkoski.....	Trammer.....	
103	"	22	"	5	do ..	do do	V. Cleriods.....	Skip tender...	
104	"	22	"	17	do ..	do do	C. Maski.....	Trammer.....	
105	"	23	May	31	Crean Hill..	do do	P. Billy.....	Crusherman...	
106	"	26	July	15	No. 2.....	do do	P. Koski.....	Drill helper...	
107	"	26	June	9	Creighton..	do do	F. Berarino.....	Trammer.....	
108	"	31	"	15	do ..	do do	A. Waka.....	Drill runner...	
109	June	3	"	17	No. 2.....	do do	S. Waurio.....	Trammer.....	
110	"	9	"	19	Creighton..	do do	B. Edward.....	Trammer.....	
111	"	12	"	22	do ..	do do	M. Anderson.....	Scaler.....	
112	"	14	July	3	No.2.....	do do	A. Fuomi.....	Trammer.....	
113	"	14	"	2	Creighton..	do do	R. Salvatone....	Trammer.....	
114	"	18	"	9	No.2.....	do do	L. Holamas.....	Drill helper..	
115	"	19	June	30	Creighton..	do do	B. Scobie.....	Trammer boss..	
116	"	20	"	30	Crean Hill..	do do	B. Zardo.....	Steel sharpener	
117	"	20	July	28	Creighton..	do do	N. Variarock....	Chute tender..	
118	"	20	Aug.	11	do ..	do do	A. Leskinan....	Trammer.....	
119	"	21	"	18	do ..	do do	V. Godin.....	Drill runner..	
120	"	22	July	16	No.2... ..	do do	T. Larrilla.....	Drill runner...	
121	"	23	"	2	No.3.....	do do	J. Prista.....	Crusherman...	
122	"	23	"	3	No.3.....	do do	A. Niemi.....	Drill runner...	
123	"	30	Aug.	20	No.3.....	do do	F. Korclitz.....	Trammer.....	
124	July	3	July	22	Creighton..	do do	T. Farino.....	Trammer.....	
125	"	3	"	12	do ..	do do	S. Mohl.....	Trammer.....	
126	"	7	"	21	do ..	do do	G. Eacinti.....	Trammer.....	
127	"	8	"	17	do ..	do do	D. Constantini...	Trammer.....	
128	"	9	"	26	do ..	do do	M. Joseph.....	Trammer.....	
129	"	9	"	28	do ..	do do	M. Antono.....	Drill runner...	
130	"	10	Sept.	1	do ..	do do	J. Trepoli.....	Trammer.....	
131	"	18	July	29	do ..	do do	M. Castanzo....	Trammer.....	
132	"	18	"	31	do ..	do do	W. Pedlar.....	Level boss....	
133	"	18	Aug.	1	do ..	do do	M. Cuomo.....	Trammer.....	
134	"	29	"	11	do ..	do do	H. Procpicijki...	Drill helper...	
135	"	30	"	29	do ..	do do	H. Yuka.....	Drill runner...	
136	"	30	Nov.	5	do ..	do do	A. Harju.....	Drill runner...	
137	Aug.	1	Aug.	26	No. 2.....	do do	R. K. Paton.....	Surveyor.....	
138	"	6	"	21	Creighton..	do do	V. Hilka.....	Drill helper...	
139	"	7	"	26	No. 2.....	do do	T. Gottaneo.....	Laborer.....	
140	"	11	"	20	Creighton..	do do	J. Luomo.....	Drill runner...	
141	"	11	"	22	do ..	do do	A. Maki.....	Drill runner...	
142	"	12	"	27	do ..	do do	S. Monserrat....	Trammer.....	
143	"	12	"	22	do ..	do do	B. Domenico.....	Trammer.....	
144	"	13	"	22	do ..	do do	E. Kivimaki.....	Drill runner...	
145	"	16	Sept.	3	No. 2.....	do do	O. Tobin.....	Trammer.....	



## or about Mines, 1913.—Continued

Nationality of Injured.	Age.	Married or single.	Below ground.	Above ground.	Nature and cause of accident.
Finn.....	24	S	1	.....	Finger bruised by rock falling from chute.
English-speaking.....	25	S	1	.....	Face burned by carbide lamp.
Pole.....	20	S	1	.....	Starting chute, wrist and head cut when rock started.
Finn.....	32	M	1	.....	Head cut by rock while scaling.
Pole.....	28	S	1	.....	Wrist sprained while lifting machine.
Pole.....	28	S	1	.....	Fingers bruised while dumping car.
Italian.....	37	M	1	.....	Finger crushed while barring chute.
Pole.....	20	S	1	.....	Foot crushed by car.
Austrian.....	25	S	.....	1	Foot crushed by piece of rock.
Finn.....	22	S	1	.....	Head cut, fell twenty feet off bench when wrench slipped.
Roumanian.....	30	M	1	.....	Foot bruised by rock falling from car.
Finn.....	22	S	1	.....	Scaling and rock broke staging. Fell ten feet and strained back.
Finn.....	23	S	1	.....	Walked into shaft and cut head.
Finn.....	24	S	1	.....	Face burned by carbide lamp.
Finn.....	24	M	1	.....	Piece of rock fell on foot while scaling.
Finn.....	22	S	1	.....	Fingers crushed by ore falling from chute.
Spaniard.....	24	S	1	.....	Empty car bruised leg.
Finn.....	21	S	1	.....	Fingers pinched while placing machine on bar.
English-speaking.....	22	M	1	.....	Fingers bruised while barring down chute.
Italian.....	23	S	.....	1	Hand bruised.
Pole.....	29	M	1	.....	Foot bruised by piece of ore rolling out of chute.
Finn.....	35	M	1	.....	Leg bruised while barring chute.
Frenchman.....	35	M	1	.....	Wrench slipped while unscrewing pipe. Fell down stope and sprained ankle.
Finn.....	29	S	1	.....	Arm injured while removing pump from skip.
Italian.....	21	S	.....	1	While barring, arm struck iron plate. The pain caused him to faint and he fell against crusher. Head cut.
Finn.....	22	S	1	.....	Air plug blew out and cut his face.
Austrian.....	28	S	1	.....	Hand injured by piece of ore.
Pole.....	26	S	1	.....	Hand injured while barring chute.
Spaniard.....	24	S	1	.....	Finger bruised by rock.
Pole.....	22	M	1	.....	Hand bruised between car and rock.
Italian.....	42	M	1	.....	Ankle bruised by rock rolling down pile.
Italian.....	45	M	1	.....	Sprained back while lifting rock.
Italian.....	22	M	1	.....	Jammed finger while tightening chuck wrench.
Spaniard.....	22	S	1	.....	Finger jammed between car and ore.
Italian.....	31	M	1	.....	Leg jammed between car and platform.
English-speaking.....	23	S	1	.....	Hand jammed by rock against car.
Pole.....	31	S	1	.....	Hand bruised when wrench slipped.
German.....	24	M	1	.....	Hand cut while lifting rock.
Finn.....	22	S	1	.....	Hand injured by falling ore while scaling.
Finn.....	26	S	1	.....	Eye cut by piece of rock while scaling.
English-speaking.....	24	S	1	.....	Fell off ladder at 9th level, striking back against guard rail.
Finn.....	30	S	1	.....	Foot injured while setting up bar.
Italian.....	24	S	.....	1	Foot bruised by rock rolling on it at crusher.
Finn.....	24	S	1	.....	Fingers crushed while setting up machine.
Finn.....	24	S	1	.....	Head cut by falling ground, starting hole with hammer drill.
Spaniard.....	33	S	1	.....	Foot crushed by rock while loading car.
Italian.....	31	M	1	.....	Fingers bruised while loading car.
Finn.....	24	S	1	.....	Foot bruised by fall of small rock in raise.
Finn.....	23	S	1	.....	Foot caught in frog and car ran over it.

Table of Non-Fatal Accidents in

No	Date of Accident.	Date of Recovery.	Name of Mine.	Name of Owner.		Name of Injured.	Occupation of Injured.
146	Aug. 17	Sept. 5	Creighton..	Canadian	Copper Co...	J. Behenna.....	Hoistman.....
147	" 21	" 26	No. 2.....	do	do	... E. Kantomaki....	Pumpman.....
148	" 25	" 4	Crean Hill..	do	do	... T. Kostynyk.....	Crusherman...
149	Sept. 1	" 15	Creighton..	do	do	... M. Zaich.....	Drill runner...
150	" 2	" 21	do ..	do	do	... S. Guhaien.....	Drill runner...
151	" 5	" 25	No. 2.....	do	do	... M. Anderson.....	Timberman...
152	" 5	" 15	Crean Hill..	do	do	... A. Hawrylewicz..	Trammer.....
153	" 6	" 18	do ..	do	do	... Y. Lukin.....	Trammer.....
154	" 13	" 30	No. 3.....	do	do	... M. Luoma.....	Drill runner...
155	" 15	" 25	Crean Hill..	do	do	... M. Sepponen.....	Drill runner...
156	" 16	Oct. 14	No. 2.....	do	do	... A. Halmi.....	Drill runner...
157	" 23	.....	No. 3.....	do	do	... S. Giovanni.....	Trammer.....
158	" 24	.....	Crean Hill..	do	do	... B. Chorney.....	Trammer.....
159	" 24	Oct. 13	do ..	do	do	... G. Naczuk.....	Trammer.....
160	" 24	Nov. 24	No. 3.....	do	do	... M. Vorkopan....	Drill helper...
161	" 25	Oct. 15	No. 3.....	do	do	... Y. Lakso.....	Trammer.....
162	" 27	Mar. 1	Creighton..	do	do	... J. Campice.....	Trammer.....
163	Oct. 3	Oct. 15	Creighton..	do	do	... A. Gasperoski....	Drill helper...
164	" 8	Dec. 18	Crean Hill..	do	do	... M. Sepponen.....	Drill runner...
165	" 9	" 31	No. 2.....	do	do	... A. Selemba.....	Timberman...
166	" 18	Nov. 10	Creighton..	do	do	... S. Lint.....	Scaler.....
167	" 19	Oct. 30	Crean Hill..	do	do	... A. Hawrylewicz..	Trammer.....
168	" 23	Feb. 28	No. 3.....	do	do	... S. Ranchink.....	Trammer.....
169	" 25	Dec. 2	Creighton..	do	do	... F. Luigi.....	Trammer.....
170	" 25	.....	do ..	do	do	... M. Protzuk.....	Drill helper...
171	" 27	Nov. 22	No. 2.....	do	do	... V. Kanio.....	Trammer.....
172	Nov. 3	Jan. 12	Crean Hill..	do	do	... W. Jeffery.....	Drill helper...
173	" 3	.....	Creighton..	do	do	... L. Condensio.....	Drill runner...
174	" 7	Nov. 17	do ..	do	do	... C. Koreski.....	Trammer.....
175	" 10	" 25	No. 3.....	do	do	... S. Walpati.....	Trammer.....
176	" 14	Dec. 10	No. 3.....	do	do	... Y. Yusela.....	Drill helper...
177	" 23	" 15	No. 3.....	do	do	... J. De Martin.....	Trammer.....
178	" 27	" 15	No. 3.....	do	do	... G. Artivio.....	Laborer.....
179	" 20	" 20	No. 3.....	do	do	... John Mumi.....	Drill runner...
180	" 29	" 8	No. 2.....	do	do	... J. Toving.....	Skip tender...
181	Dec. 4	" 15	Creighton..	do	do	... Ivan Supie.....	Trammer.....
182	" 9	" 26	do ..	do	do	... I. Grian.....	Trammer.....
	" 9	Died	do ..	do	do	... K. E. Olson.....	Timberman...
	" 9	Mar. 21	do ..	do	do	...	...
	" 9	Jan. 5	do ..	do	do	... Wasyl Schlarido..	Trammer.....
	" 9	Dec. 29	do ..	do	do	... Geo. Doney.....	Drill runner...
183	" 14	.....	No. 3.....	do	do	... L. Jarvinuik.....	Trammer.....
184	" 15	Jan. 8	No. 3.....	do	do	... Yan Maki.....	Block holer...
185	" 15	" 12	No. 2.....	do	do	... W. Kendeycwiz..	Timberman...
186	" 18	.....	No. 3.....	do	do	... Angelo Simon....	Laborer.....
187	" 19	Jan. 19	Creighton..	do	do	... Mat. Lippinen...	Drill runner...
188	" 21	Feb. 3	Crean Hill..	do	do	... N. Netropka....	Trammer.....

## or about Mines, 1913.—Continued

Nationality of Injured.	Age.	Married or single.	Below ground.	Above ground.	Nature and cause of accident.
English-speaking....	25	S	.....	1	Thumb broken when throwing friction on hoist.
Finn.....	27	S	.....	1	Fingers crushed while unloading iron plates from truck.
Austrian.....	21	S	.....	1	Finger crushed in rock house.
Pole.....	22	S	1	.....	Arm bruised while taking down machine.
Italian.....	29	M	1	.....	Thumb bruised while starting hole.
Finn.....	28	S	1	.....	Head cut by piece of ore while going up manway.
Pole.....	32	S	1	.....	Hand crushed while loading car.
Pole.....	35	S	1	.....	Shoulder cut and arm bruised by rock from sand blast.
Finn.....	29	S	1	.....	Foot bruised while timbering in ore pocket.
Finn.....	27	S	1	.....	Foot wrenched while timbering shaft.
Finn.....	35	S	1	.....	Slipped and injured shoulder while going down manway.
Italian.....	27	S	1	.....	Fingers bruised while loading car.
Austrian.....	23	S	1	.....	Rock fell on foot at chute.
Austrian.....	32	M	1	.....	Fingers bruised while loading car.
Finn.....	28	S	1	.....	Foot bruised while moving drill.
Finn.....	33	M	1	.....	Foot injured by rock falling from back of drift.
Italian.....	27	M	1	.....	Leg broken while dumping car at skip.
Pole.....	31	M	1	.....	Fingers bruised while moving machine.
Finn.....	33	S	1	.....	Head cut by rock falling from back, while drilling.
Finn.....	23	S	1	.....	Leg broken. Skip on which he was working in shaft broke.
Finn.....	30	S	1	.....	Eye injured by premature explosion of sand blast.
Pole.....	35	S	1	.....	Thumb crushed while filling car at chute.
Pole.....	25	S	1	.....	Leg broken by piece of ore rolling down pile.
Italian.....	31	M	1	.....	Fingers bruised when car dumped.
Pole.....	23	S	1	.....	While scaling, a piece of loose rock fell and struck foot, cutting it off below ankle.
Finn.....	28	S	1	.....	Finger bruised while tramming.
English-speaking....	27	S	1	.....	Foot injured by rock falling from back of drift.
Italian.....	45	S	1	.....	Finger broken while tipping machine.
Pole.....	24	S	1	.....	Finger bruised while dumping car.
Italian.....	25	S	1	.....	Leg injured by ore rolling down pile.
Finn.....	30	S	1	.....	Slipped and injured head, while taking down machine.
Italian.....	24	S	1	.....	Foot injured by ore rolling down pile.
Italian.....	24	S	.....	1	Leg injured while dismantling head frame.
Finn.....	32	S	1	.....	Rock rolled down stope and injured foot.
Pole.....	31	S	1	.....	Slipped and fell into skip.
Pole.....	37	M	1	.....	Squeezed between two cars.
Pole.....	22	S	1	.....	
Swede.....	29	M	1	.....	Pillars Nos. 1 and 2 fell, and broke 5th level dry wall.
Pole.....	22	S	1	.....	
English-speaking....	36	M	1	.....	
Pole.....	28	S	1	.....	Finger bruised while loading car.
Finn.....	48	M	1	.....	Drilled into explosive while blockholing.
German.....	35	M	1	.....	Finger jammed by timber.
Italian.....	26	S	.....	1	Eye injured by piece of rock.
Finn.....	31	.....	1	.....	Broke small bone of shoulder, while lifting a machine.
Russian.....	35	M	1	.....	Three fingers blown off. Experimented with explosive by lighting small piece of fuse with detonator attached.

Table of Non-Fatal Accidents

No.	Date of Accident.	Date of Recovery.	Name of Mine.	Name of Owner.	Name of Injured.	Occupation of Injured.
189	Aug. 5	Oct. 9	Long Lake Gold Mine.	Canadian Exploration Co. ....	E. King.....	Drill helper...
190	Sept. 20	" 27	Queensboro Mine.....	Canadian Sulphur Ore Co. ....	J. Adams.....	Drill runner..
191	May 7	.....	Alexandra..	Canadian Gold and Silver Mining Co. ....	W. Rae.....	Trammer.....
192	" 28	Aug. 4	Chambers Ferland..	Chambers Ferland Mining Co. ....	D. McLeod.....	Engineer.....
193	Nov. 11	Nov. 25	do	do do	G. Stingle.....	Drill runner..
194	Jan. 13	Mar. 18	Cobalt Lake	Cobalt Lake Mining Co.	M. Szalyone.....	Skip tender...
195	" 22	Feb. 20	do	do do	J. Harja.....	Drill runner...
196	Ap'l 1	Ap'l 9	do	do do	A. Pelletta.....	Pipe fitter.....
197	" 11	" 21	do	do do	W. Mathieson....	Trammer.....
198	Aug. 26	Sept. 6	do	do do	S. Shutva.....	Drill runner..
199	Sept. 17	Totally incapacitated.	do	do do	J. Waller.....	Drill helper...
200	Oct. 16	Dec. 15	do	do do	J. McGregor.....	Drill runner...
201	Sept. 18	Nov. 1	Townsite...	Cobalt Townsite Mining Co. ....	E. Putlak.....	Trammer.....
202	Jan. 17	Jan. 29	Colonial....	Colonial Mining Co....	J. Bennetts.....	Drill runner..
203	" 21	Feb. 10	do ...	do do ...	W. Chapman.....	Trammer.....
204	" 30	Ap'l 4	Coniagas...	Coniagas Mines, Ltd..	J. Rochester.....	Ore sorter.....
205	Mar. 25	May 27	Crown Reserve..	Crown Reserve Mining Co. ....	Thos. Scott.....	Mechanic.....
206	Mar. 17	Jan. 3	Henderson Talc Mine	Cross and Wellington..	W. Young.....	Drill runner...
207	July 23	Totally incapacitated.	Dane Mine.	Dane Copper Co.....	Chas. Johnson... S. Cockshutt....	Contractor.... Trammer.....
208	Jan. 20	Ap'l 3	Dome.....	Dome Mines, Ltd.....	A. Kitchen.....	Trammer boss.
209	" 25	Mar. 6	do .....	do do .....	W. Pearson.....	Crusherman...
210	Feb. 26	May 5	do .....	do do .....	J. B. James.....	Millman.....
211	Mar. 24	Ap'l 7	do .....	do do .....	P. Gutchner.....	Machinist....
212	Ap'l 21	May 13	do .....	do do .....	T. Ruyich.....	Trammer.....
213	" 22	" 14	do .....	do do .....	F. Krynaric.....	Trammer.....
214	June 11	July 17	do .....	do do .....	J. Howey.....	Timberman...
215	" 18	" 1	do .....	do do .....	T. Fortune.....	Carpenter....
216	July 2	Aug. 4	do .....	do do .....	J. Ello.....	Laborer.....
217	" 5	July 20	do .....	do do .....	J. J. Jordan....	Mill foreman..
218	" 16	Aug. 13	do .....	do do .....	J. Berlick.....	Trammer.....
219	" 22	" 12	do .....	do do .....	J. Neil.....	Laborer.....
220	" 29	" 13	do .....	do do .....	U. Birnorsink...	Trammer.....
221	Sept. 8	Sept. 22	do .....	do do .....	J. Snider.....	Mule driver...
222	Nov. 5	Nov. 14	do .....	do do .....	K. Skobiato....	Chuteman....
223	" 7	" 17	do .....	do do .....	R. Kruger.....	Millman.....
224	" 13	Dec. 19	do .....	do do .....	V. Hill.....	Drill runner..
225	Dec. 18	Mar. 9	do .....	do do .....	N. Novark.....	Laborer.....
226	Jan. 20	Feb. 18	Dome Lake.	Dome Lake Mining and Milling Co. ....	N. Zrenck.....	Trammer.....



## in or about Mines, 1913.—Continued.

Nationality of Injured,	Age,	Married or single,	Below ground,	Above ground,	Nature and Cause of Accident.
Pole.....			1		Foot bruised by rock rolling down pile.
English-speaking.....			1		Car fell down shaft, injuring head and arm.
English-speaking....	34		1		Timber rolled on foot.
English-speaking....	19	S		1	Leg broken while helping to move tripod.
English-speaking....	24		1		Fell from bucket in shaft thirty-five feet and fractured three ribs.
Pole.....	24		1		Bucket became detached from cable and fell down winze, carrying out lagging, which broke two of his ribs.
Pole.....	38	S	1		Drilled into hole containing explosive.
English-speaking....	25	M		1	Steel fell, fracturing toe.
English-speaking....	20	S	1		Foot caught in track and injured by loaded car.
Pole.....	40	S	1		Started to slide down cable in winze. Fell, severely shaken up.
English-speaking....	30	M	1		Premature explosion while examining a missed hole.
English-speaking....	35	M	1		
Pole.....	38	M	1		Drawn with car down raise, receiving scalp wound.
English-speaking....	35		1		Leg fractured and ankle crushed while scaling.
English-speaking....	24	S	1		While sand blasting, returned before blast went off.
English-speaking....	35	S	1		Rock fell from bucket and bruised foot.
English-speaking....	50	M		1	Foot caught between revolving trommel and splash board.
English-speaking....				1	Arm broken by being jammed.
English-speaking....	55	M	1		Leg broken by fall of talc.
English-speaking....	45	M	1		Drilled into missed hole.
Pole.....	22	S	1		
English-speaking....	25		1		Piece of ore fell from car, fracturing leg.
English-speaking....	27			1	Arm mangled by pulley of conveyor belt while applying belt dressing.
English-speaking....	38			1	Hand injured by being caught in friction pulley of conveyor belt.
English-speaking....	20	S		1	Face burned by babbitt spurting on him.
Austrian.....	30	M	1		Hand crushed between rock and chute board.
Austrian.....	22	S	1		Foot crushed by rock falling from chute.
English-speaking....	40	M	1		Two ribs broken by fall when staging broke.
English-speaking....				1	Face cut by falling against axe.
Italian.....	18	S		1	Severely crushed while lowering tube mill gear.
English-speaking....	28	S		1	Burned by arc from electric switch.
Russian.....	23	S	1		Toe fractured by rock rolling down pile.
English-speaking....	40	M		1	Finger crushed while moving machinery.
Austrian.....	20	S	1		Fingers crushed while barring at chute.
Pole.....	21	S	1		Leg bruised, squeezed by cars.
Pole.....	31	M	1		Finger crushed while barring at chute.
English-speaking....	23	S		1	Ankle sprained by fall off mortar block.
Finn.....	30	S	1		Leg injured by rock rolling down pile.
Austrian.....	19	S		1	Hand caught in pulley of conveyor belt.
Pole.....			1		Rock fell from ascending cage and cut face.

Table of Non-Fatal Accidents

No.	Date of Accident.	Date of Recovery.	Name of Mine.	Name of Owner.	Name of Injured.	Occupation of Injured.
227	May 20	June 3	Dome Lake.	Dome Lake Mining & Milling Co. ....	F. Dunne.....	Timberman...
228	June 10	" 27	Murray....	British America Nickel Corporation..	N. Finni.....	Drill runner..
229	Mar. 21	Ap'l 2	Nova Scotia	Dominion Reduction Co.	A. Dotynezuk....	Laborer.....
230	Nov. 17	.....	Foley-O'Brien..	Foley-O'Brien, Ltd.....	R. Doyle.....	Drill helper...
231	Ap'l 24	.....	Hargraves..	Hargraves Silver Mines, Ltd.....	W. Gribben.....	Drill runner...
232	Feb. 1	Feb. 25	Hollinger..	Hollinger Gold Mines, Ltd. ....	J. Woodlefsky... M. Moses.....	Cage tender... Laborer.....
233	" 13	Mar. 5	do ..	do do	V. Gosti.....	Trammer.....
234	" 16	" 15	do ..	do do	J. Dubois..... E. Desoneau....	Drill runner... Teamster.....
235	Mar. 4	" 15	do ..	do do	S. Skinner.....	Drill runner...
236	May 5	May 16	do ..	do do	G. Hemmerick... F. Barodine.... S. Wilcox.....	Nipper..... Drill runner... Millman.....
237	" 24	June 10	do ..	do do	P. Krustook..... P. Ossiuick..... J. Marcovitch... F. Gentile..... J. Robibero....	Trammer..... Trammer..... Drill helper... Drill helper... Drill runner...
238	" 27	" 13	do ..	do do		
239	June 11	" 20	do ..	do do		
240	July 25	.....	do ..	do do		
241	Aug. 6	Aug. 19	do ..	do do		
242	Sept. 3	Sept. 29	do ..	do do		
243	" 27	Dec. 15	do ..	do do		
244	Oct. 14	Oct. 27	do ..	do do		
245	Feb. 20	Mar. 2	Hudson Bay (Gowganda)	Hudson Bay Mines, Ltd.	L. Shock.....	Trammer.....
246	May 20	Perm't	Hudson Bay (Cobalt).	do do	L. Davis.....	Drill runner..
247	" 24	July 3	do	do do	I. Johnson.....	Drill runner..
248	June 5	" 5	Kerr Lake.	Kerr Lake Mining Co..	H. Morash.....	Drill runner..
249	" 6	June 18	do ..	do do	N. Robar.....	Foreman.....
250	July 8	Aug. 23	do ..	do do	N. Kurnicki.....	Trammer.....
251	Sept. 25	Oct. 23	Lawson....	La Rose Mines, Ltd..	N. Fredic.....	Trammer.....
252	Oct. 8	.....	Mann.....	Mann Mines, Ltd.....	L. Bakanerski...	Trammer.....
253	June 19	Dec. 29	McIntyre...	McIntyre Porcupine Mines, Ltd.....	N. Oraskovitsk...	Timberman...
254	Oct. 28	" 9	do	do do	A. R. Edwards...	Electrician...
255	Jan. 6	Jan. 28	McKinley-Darragh.	McKinley-Darragh-Savage Mines, Ltd..	R. Horne.....	Drill helper...
256	Mar. 10	Ap'l 12	do	do do	N. Bojco.....	Nipper.....
257	Aug. 21	Sept. 2	do	do do	F. McNamara....	Drill runner..
258	Jan. 17	Jan. 27	Miller Lake O'Brien..	Miller Lake O'Brien Mines .....	F. Fransel..... P. Karulenski...	Foreman..... Trammer.....
259	May 1	June 9	do	do do	W. Melville.....	Foreman.....
260	June 9	Aug. 9	do	do do	W. Kermode.....	Drill runner..
261	Sept. 1	Sept. 29	do	do do		

## in or about Mines, 1913.—Continued.

Nationality of Injured.	Age.	Married or single.	Below ground.	Above ground.	Nature and Cause of Accident.
English-speaking....	38	M	1	.....	Fell twenty feet and strained shoulder when sprague slipped.
Finn.....	38	S	1	.....	Finger broken by being pinched between rocks.
Pole.....	40	.....	.....	1	Leg bruised by cam shaft rolling on him.
English-speaking....	28	M	1	.....	Eyes injured by picking into powder in broken ore.
English-speaking....	.....	.....	1	.....	Foot was crushed by falling rock while scaling.
Pole.....	31	.....	1	.....	Struck by rock falling down shaft.
Assyrian.....	43	.....	.....	1	Ribs fractured by being struck by falling tree.
Italian.....	37	.....	1	.....	Right arm broken by being caught between cars.
English-speaking....	50	M	1	.....	Fell across support of staging and broke rib.
English-speaking....	17	S	.....	1	Fell from wagonload of wood and shoulder injured.
English-speaking....	26	M	1	.....	While carrying lagging, slipped and broke clavicle.
English-speaking....	22	S	1	.....	Attempted to board moving cage.
Italian.....	24	S	1	.....	Struck on eye by bar while barring chute.
English-speaking....	50	S	.....	1	Sight of one eye destroyed by whitewash under pressure.
Austrian.....	35	M	1	.....	Finger crushed between car and chute.
Russian.....	46	M	1	.....	Finger crushed between car and cage.
Pole.....	21	S	1	.....	Knee and spine injured when cage dropped.
Italian.....	24	S	1	.....	Picked into detonator or dynamite in broken ore.
Italian.....	26	S	1	.....	
Pole.....	50	.....	1	.....	Injured in explosion due to drilling into missed hole.
English-speaking....	30	.....	1	.....	Lost sight of both eyes through drilling into cutoff hole.
Finn.....	30	.....	1	.....	Struck by falling rock and skull fractured while scaling.
English-speaking....	45	M	1	.....	Received scalp wounds in fall from chain ladder.
English-speaking....	47	M	1	.....	Struck by rock while examining stope.
Pole.....	24	S	1	.....	Crushed by fall of rock from hanging wall.
Austrian.....	35	.....	1	.....	Caught between shaft timber and cage and leg bruised.
Russian.....	28	.....	1	.....	He fell forty-two feet down shaft while trying to prevent fall of loaded bucket. Thigh, wrist and ribs broken.
Russian.....	.....	.....	1	.....	Slipped on turn plate and broke leg while unloading timber.
English-speaking....	39	M	1	.....	Standing in manway with hand on cage guides when cage came up.
English-speaking....	19	S	1	.....	While running ahead of car, slipped and wheel ran over foot.
Russian.....	26	.....	1	.....	Injured arm while riding on cage with steel.
English-speaking....	28	S	1	.....	Head bruised while scaling.
English-speaking....	.....	.....	1	.....	Arm injured while riding on cage.
Pole.....	45	M	1	.....	Wrist sprained by being jammed between car and pipe.
English-speaking....	28	S	1	.....	Hand blown off while removing powder from hole.
English-speaking....	26	.....	1	.....	Fell while scaling in shaft.

Table of Non-Fatal Accidents

No.	Date of Accident.	Date of Recovery.	Name of Mine.	Name of Owner.	Name of Injured.	Occupation of Injured.
262	Oct. 30	Dec. 29	Miller Lake O'Brien	Miller Lake O'Brien Mines	J. Phillion	Drill runner
263	Feb. 20	May 19	Garson	Mond Nickel Co.	W. Uhlanioy	Trammer
264	Mar. 1	Ap'l 10	do	do	P. Chis	Trammer
265	April 2	May 2	do	do	T. Tall	Drill helper
266	" 23	.....	Victoria	do	A. Matson	Drill runner
267	June 30	July 14	Garson	do	J. Drummend	Machinist
268	July 20	.....	North Star	do	A. Chausic	Drill runner
269	Sept. 8	Sept. 21	do	do	C. Silampi	Drill runner
270	Oct. 20	.....	Worthington	do	N. Barcouch	Drill runner
271	Nov. 20	Dec. 24	North Star	do	T. Ojreck	Drill helper
272	Dec. 4	.....	Garson	do	O. Capink	Trammer
273	Jan. 11	Mar. 1	Moose Mountain	Moose Mountain Mines, Ltd.	J. Farak	Hoistman
274	July 1	Oct. 13	do	do	R. Sturgeon	Millman
275	Sept. 21	.....	do	do	P. Alvano	Drill runner
276	" 20	Nov. 26	do	do	B. Carlo	Trammer
277	Nov. 3	" 17	do	do	B. Baruyne	Trammer
278	Jan. 5	Jan. 21	Nipissing	Nipissing Mining Co.	L. Gaspari	Millman
279	Mar. 24	Ap'l 23	do	do	J. Trottier	Laborer
280	" 28	" 11	do	do	E. Bellanger	Drill runner
281	April 5	.....	do	do	D. Hammond	Millman
282	" 13	Sept. 8	do	do	E. Ayotte	Pumpman
283	" 18	May 13	do	do	W. Majdam	Trammer
284	" 19	" 2	do	do	F. Koloski	Drill helper
285	Aug. 9	Aug. 24	do	do	J. McGregor	Mill foreman
286	Sept. 29	Oct. 20	do	do	G. Vellonois	Trammer
287	Feb. 9	Mar. 3	Northern Customs	Northern Customs Concentrator	W. Bennett	Millman
288	Mar. 4	.....	do	do	F. Capitano	Laborer
289	Nov. 17	Dec. 15	do	do	E. Boyce	Carpenter
290	May 16	June 1	Northern Pyrites	Northern Pyrites Co.	O. Wilson	Drill runner
291	Aug. 30	Oct. 11	do	do	M. Fedyszyn	Trammer
292	Nov. 6	Permanently Incap'd	do	do	E. Kaartinen	Drill helper
293	Jan. 30	Mar. 1	O'Brien	M. J. O'Brien	E. Smith	Drill helper
294	Sept. 9	Oct. 10	do	do	R. Goldsworthy	Drill helper
295	Dec. 15	Jan. 13	do	do	M. Dolyrunick	Cage tender
296	Jan. 24	Feb. 9	Penn-Canadian	Penn-Canadian Mines	T. Osborne	Drill-runner
297	July 7	July 30	do	do	F. Babaneo	Drill-runner
298	Aug. 25	Sept. 30	do	do	W. Janes	Machinist
299	Dec. 9	Dec. 26	do	do	A. Haapala	Trammer
300	May 8	May 19	Peterson Lake	Peterson Lake Silver	H. Wilcox	Drill-runner
301	Aug. 26	Sept. 6	do	Cobalt Mining Co.	J. McGuire	Foreman
302	May 1	May 12	Right of Way	Right of Way Mines Co.	A. Agmoinin	Drill-runner



## in or about Mines, 1913.—Continued.

Nationality of Injured.	Age.	Married or single.	Below ground.	Above ground.	Nature and Cause of Accident.
English-speaking....	30	.....	1	.....	Finger injured while moving drill.
Pole.....	24	S	1	.....	Struck by flying rock when another workman drilled into missed hole.
Pole.....	.....	.....	1	.....	Right leg broken, due to cage falling a few feet.
Finn.....	.....	S	1	.....	Slipped and fell twenty-five feet when tightening up jack screw.
Finn.....	25	M	1	.....	Forearm broken by rock falling from rock pentice.
English-speaking....	24	S	.....	1	Ribs broken by fall when pipe-tongs broke.
Finn.....	24	S	1	.....	Skull fractured by fall of small piece of ore in west pit.
Finn.....	.....	.....	1	.....	Premature explosion, due to untamped hole.
Pole.....	27	S	1	.....	Bruised from fall when staging in shaft broke.
Roumanian.....	36	S	1	.....	Head cut while scaling.
Pole.....	33	M	1	.....	Leg broken by piece of ore rolling down pile.
English-speaking....	30	.....	.....	1	Held lighted cigarette to end of detonator.
Finn.....	.....	.....	1	.....	Arm crushed while applying belt dressing to conveyor belt.
Italian.....	.....	.....	1	.....	Leg broken; fell from bench in glory hole.
Pole.....	.....	S	1	.....	Knee torn by rock loosened by driller above him.
Italian.....	.....	.....	.....	1	Rib broken by rock from chute.
English-speaking....	20	S	.....	1	Finger amputated by being caught by scoop of tube mill.
English-speaking....	33	M	1	.....	Foot injured by rock from chute in rock house.
English-speaking....	28	S	.....	1	Toe bruised by falling rock.
English-speaking....	40	M	1	.....	Solution in high grade mill splashed in eye.
Austrian.....	22	S	1	.....	Leg broken when cage dropped.
Russian.....	22	S	1	.....	Foot bruised by car.
English-speaking....	26	M	.....	1	Foot crushed by rock.
Italian.....	26	.....	.....	1	Thumb crushed at tube mill.
English-speaking....	30	.....	.....	1	Foot crushed while dumping car.
Italian.....	37	.....	.....	1	Burned by splash of zinc.
English-speaking....	38	M	.....	1	Head cut by being struck by handle of winch.
English-speaking....	.....	.....	1	.....	Scaffold collapsed; fell fourteen feet and landed on stump.
Pole.....	.....	.....	1	.....	Two ribs broken by fall of hammer drill.
Finn.....	23	S	1	.....	Hand caught between sheave and cable at terminal.
English-speaking....	.....	.....	1	.....	Struck by fall of ore in stope, back broken.
English-speaking....	22	.....	1	.....	Fell from staging in stope and fractured two ribs.
Austrian.....	23	.....	1	.....	Collar-bone broken by piece of falling rock.
English-speaking....	23	S	1	.....	Back injured when cage dropped.
Italian.....	25	M	1	.....	While sledging rock piece flew in his eye.
English-speaking....	39	M	.....	1	Hand caught between drill and back of drift.
English-speaking....	22	S	1	.....	Fell against wall and injured leg.
English-speaking....	.....	.....	1	.....	Piece of rock fell, injuring head and shoulder.
English-speaking....	.....	.....	1	.....	While sledging rock piece cut hand.
English-speaking....	.....	.....	1	.....	Rail fell on foot, bruising same.
Italian.....	27	S	1	.....	Foot injured by rock while scaling.

Table of Non-Fatal Accidents

No.	Date of Accident.	Date of Recovery.	Name of Mine.	Name of Owner.	Name of Injured.	Occupation of Injured.
303	May 16	May 26	Right of Way.....	Right of Way Mines Co.	J. Consol .....	Trammer ....
304	Jan. 30	Mar. 24	Temiskaming.....	Temiskaming Mining Co. ....	D. McDougall ...	Timberman ..
305	Feb. 6	Feb. 18	do ..	do do	J. Smuk.....	Nipper .....
306	June 16	July 2	do ..	do do	D. McInnis.....	Drill-runner ..
307	Aug. 4	Sept. 6	Tough-Oakes....	Tough-Oakes Gold Mines	P. Sampson ....	Drill-runner .
308	May 1	.....	Trethewey.	Trethewey Silver Cobalt Mine, Ltd. ....	H. Lewis .....	Drill-runner ..
309	" 19	.....	do ..		N. Thopolnitski .	Trammer ...
310	June 12	June 23	do ..	do do	J. Gondman ....	Millman ...
311	July 11	July 31	do ..	do do	J. Guinta .....	Trammer ....
312	Sept. 20	Oct. 25	do ..	do do	G. Dunn .....	Timberman ..
313	June 21	.....	U. S. Cobalt Mine....	United States Cobalt Mining Co. ....	T. Robyk .....	Trammer ....
314	Sept. 25	Oct. 25	York Ontario..	York Ontario Silver Mines, Ltd. ....	O. Julio .....	Drill-runner .

## in or about Mines, 1913.—Continued.

Nationality of Injured.	Age.	Married or single.	Below ground.	Above ground.	Nature and Cause of Accident.
Italian .....	31	S	1	.....	Rock fell while loading car, injuring foot.
English-speaking ...	.....	.....	1	.....	Rock fell from chute and broke toe.
Austrian .....	30	.....	1	.....	Tripped over sprague and fell down stope.
English-speaking ...	30	S	1	.....	Fell from staging due to sprag giving way.
English-speaking ...	34	.....	1	.....	Fell from ladder while lowering stull.
English-speaking ...	25	S	1	.....	Used carbide drum for carrying water, explosion burnt face.
Austrian .....	30	.....	1	.....	Fingers crushed while dumping car.
English-speaking ...	25	S	.....	1	Foot bruised when pulley fell.
Pole .....	.....	.....	1	.....	Toe fractured by rock falling from car.
English-speaking ...	20	S	1	.....	Skull fractured when timber slipped.
Pole .....	37	.....	1	.....	Arm broken when hose blew off.
English-speaking ...	26	S	1	.....	Picked into detonator or small piece of powder.

### Accidents at Metallurgical Works.

The metallurgical works which come under the Mining Act of Ontario include blast furnaces, copper-nickel smelters and converter plants, silver smelters and acid plants. At these works during 1913 eleven fatal accidents occurred, causing the death of eleven workmen, compared with ten fatalities in 1912. Five of these fatalities occurred at blast furnaces, five at copper-nickel smelters and converter plants, one at acid works. There were no fatalities at the silver smelters. Ten occurred during the first six months of the year and one during the latter half.

At the blast furnaces one fatality during the year was due to gas, compared with five during 1912. Nearly all the blast furnaces are now equipped with pulmotors, and it is hoped that the use of this apparatus at such works will decrease the gassing fatalities.

Of the five fatalities which occurred at copper-nickel smelters during the year, four were accidents in connection with transportation operations in the yards. Owing to the noise, the short hauls, the backing in and out of buildings, and the escaping steam, especially during the winter months, this work is particularly dangerous.

In addition to the fatalities, 201 serious accidents occurred at metallurgical works as compared with 122 during 1912.

On February 10th, an Italian brakeman was injured on the charge floor at the smelter of the Canadian Copper Company, when one of a train of eight cars left the rails. He was crushed about the hips, and died the next day. He was riding between the cars contrary to the orders of the Company.

On February 8th an Italian laborer in the smelter yards of this Company slipped and struck his head against the side of a coal car. He continued work until February 18th, but died February 20th. A post-mortem showed a clot of blood on the left side of the brain and that the part of the skull where the blow was received was only 1-16 inch in thickness.

On February 20th an Italian track laborer was struck by a train backing out of the converter building of the Canadian Copper Company. He had just thrown a switch for a slag train and stepped back when he was struck by the other train and killed.

On April 3rd an English brakeman was killed in the smelter yards of the same company. He was riding on the foot-board of the tender, fell between the locomotive and the tender, and was dragged 150 feet before he was noticed.

On April 28th, a Polish baleman was killed by being splashed with hot matte when a link in the bale of a crane carrying a ladle of matte broke. This break was due to a defective weld which could not be detected by an exterior examination.

On March 18th an Austrian laborer was found gassed in the salt room of the blast furnace of the Algoma Steel Corporation. The doctor who made the post-mortem examination stated that death was due to suffocation following a hemorrhage in the walls of the stomach. The body showed flushing indicative of carbon-monoxide poisoning.

On May 21st, T. J. Brewster, aged 17, a fireman on a crane in the yards of the Canada Iron Corporation, was crushed to death between the platform and moving frame of the hoist. The jury in the verdict recommended that persons of more mature years be employed for such work.



On February 6th a negro furnace keeper was killed at the blast furnace of the Canada Iron Corporation, while helping to pull a mud gun which was frozen in the notch of No. 2 furnace. The nozzle was suddenly released, and the bar which he was holding struck him on the temple.

On May 10th, an electrician was killed at the blast furnace of The Steel Company of Canada while replacing a dead light on a 220-volt line. He was standing on a ladder, and probably received a shock which caused him to fall a distance of 12 feet, crushing his skull against the brick floor.

On November 14th, an oiler in the engine room of the Canada Furnace Company was killed when the exhaust chamber of a steam turbine blew out. He had neglected to open the exhaust before starting up the machine.

On June 5th a laborer employed in the salt cake mill of the Nichols Chemical Company, Sulphide, was killed by being caught in a pulley belt. How the accident happened could not be explained at the inquest.

The occupation and nationality of the men who were killed are shown in the following table:—

Occupation.	English speaking.	Italian.	Pole.	Austrian.	Total.
Laborer .....	.....	2	1	.....	3
Brakeman .....	1	1	.....	.....	2
Baleman .....	.....	.....	.....	1	1
Mechanic .....	1	.....	.....	.....	1
Furnace keeper .....	1	.....	.....	.....	1
Fireman .....	1	.....	.....	.....	1
Foreman .....	1	.....	.....	.....	1
Electrician .....	1	.....	.....	.....	1
Total .....	6	3	1	1	11

The ages of the men killed at metallurgical works were as follows:—

17-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	Total.
1	0	4	3	0	1	1	1	11

## Cause and Place of Fatalities.

	1912.	1913
Blast Furnaces:—		
Asphyxiation from furnace gas .....	4	1
Breaking of scaffold .....	1	0
Electrocution . . . . .	1	1
Lining of furnace falling .....	1	0
Crushed between crane platforms .....	0	1
Struck by bar of mud gun .....	0	1
Struck by broken machinery .....	0	1
	<hr/>	<hr/>
	7	5
Copper-Nickel Smelters and Converter Plants: —		
Struck by train .....	1	3
Crushed by rabbles .....	1	0
Struck by falling plank .....	1	0
Fell and struck head .....	0	1
Burned by spilled matte .....	0	1
	<hr/>	<hr/>
	3	5
Acid Plant:—		
Caught in machinery .....	0	1
	<hr/>	<hr/>
	0	1
	<hr/>	<hr/>
Total . . . . .	10	11

## Causes of Non-Fatal Accidents at Metallurgical Works

The following schedule shows the causes of the non-fatal accidents in 1913, at the metallurgical works, and the number injured:—

Burned . . . . .	40
Falling objects .....	33
Falling from elevated places .....	22
Slipped and fell .....	19
Caught by machinery .....	16
Injured by cars .....	16
Crushed between two objects .....	13
Cut by slag, matte, etc. ....	10
Struck by hammer .....	7
Foreign substance in eye .....	5
Miscellaneous . . . . .	20
	<hr/>
Total . . . . .	201

In the Subjoined Table is Given the Occupation and Nationality of the Men Injured in Metallurgical Works.

Occupation.	English speaking.	Italian.	Pole.	Finn.	Austrian	German.	Swede.	Roumanian.	Total.
Laborer.....	11	62	37	4	5			1	120
Foreman .....	4	2							6
Repair man .....	1								1
Stove tender.....	1								1
Furnace keeper.....		1	5						6
Mechanic.....	1	1							2
Pipe Fitter.....	11			4					15
Water Tender.....	1	1							2
Furnace Helper .....	3	3	2						8
Pourer.....		3							3
Furnace Blower.....	2								2
Millwright.....	2								2
Engineer.....	5								5
Tapper.....		1		2		1			4
Lineman.....	1								1
Brakeman.....	4		2						6
Mason.....		1							1
Motorman.....		1							1
Carpenter.....	4		1				1		6
Blacksmith.....	1								1
Skimmer.....	1								1
Tuyere Puncher.....			3						3
Teamster.....	1								1
Feeder.....			1						1
Electrician.....	1								1
Cupeller.....		1							1
Totals.....	55	77	51	10	5	1	1	1	201

The ages of the injured men were as follows:

17 to 20	21 to 25	26 to 30	31 to 35	36 to 40	41 to 45	46 to 50	51-60	Unknown,	Total,
22	48	55	32	21	8	4	5	6	201

Table of Fatal Accidents at

Number.	Date 1913.	Name of Works.	Name of Owner.	Name of Deceased.	Occupation of Deceased.
1	March 18.	Blast Furnace.	Algoma Steel Co....	John Volumick.	Laborer.....
2	Feb. 10...	Smelter Yard.	Canadian Copper Co.	Giovanni Pietro.	Brakeman.....
3	" 8...	do ...	do do	E. Domenico....	Laborer.....
4	" 21...	do ...	do do	P. Guisseppi....	Laborer.....
5	April 3...	do ...	do do	Chas. Hough....	Brakeman.....
6	" 28...	Smelter.....	do do	Mike Buchowski	Bale man.....
7	Nov. 14...	Power Plant ..	Canadian Furnace Co.	J. H. Bruce.....	Mechanic.....
8	Feb. 6...	Blast Furnace	Canada Iron Corp'n..	Robt. Connolly..	Furnace keeper.
9	May 21...	Smelter Yard..	do do	Thos. J. Brewster	Fireman.....
10	June 5...	Acid Works...	Nichols Chemical Co.	Louis Lavallee..	Foreman.....
11	May 10...	Blast Furnace.	Steel Co. of Canada..	J. Selkirk.....	Electrician.....



## Metallurgical Works, 1913.

Nationality of Deceased.	Age.	Married or Single.	Above ground.	Nature and Cause of Accident.
Pole.....	32	S	1	Asphyxiated in salt room.
Italian.....	27	S	1	Injured while shunting cars.
Italian.....	27	M	1	Fell and struck head against rail; died Feb. 20.
Italian.....	55	M	1	Stepped on track ahead of shunting engine.
English-speaking.	27	S	1	Fell from tender under wheels of locomotive.
Austrian.....	30	S	1	Burned by spilled matte, when link holding ladle broke.
English-speaking.	33	M	1	Head of exhaust chamber steam turbine generator blew out.
Negro.....	42	M	1	Struck on head by bar, when mud gun suddenly released.
English-speaking.	17	S	1	Crushed between crane platforms.
English-speaking.	35	M	1	Clothing caught in shafting.
English-speaking.	50	M	1	Electrocuted while repairing lamp.
Total.....	.....	.....	11	

Table of Non-Fatal Accidents

No.	Date of Accident.	Date of Recovery.	Name of Works.	Name of Owner.	Name of Injured.	Occupation of Injured.
1	Jan. 10	Feb. 21	Blast Furnace..	Algoma Steel Corporation.....	Gutano Stocco....	Laborer.....
2	" 13	Jan. 21	do ..	do do	G. Marsino.....	Laborer.....
3	" 27	Feb. 10	do ..	do do	R. Primo.....	Laborer.....
4	Feb. 1	" 10	do ..	do do	Wm. Coatby.....	Foreman.....
5	Feb. 1	" 14	do ..	do do	P. Sacripanti.....	Laborer.....
6	" 5	" 16	do ..	do do	V. Grabowski....	Laborer.....
7	" 6	" 16	do ..	do do	G. Pasianita.....	Laborer.....
8	" 16	Mar. 1	do ..	do do	M. Butkovic.....	Laborer.....
9	" 23	.....	do ..	do do	S. Paluck.....	Laborer.....
10	Mar. 8	Mar. 20	do ..	do do	J. Maslyk.....	Laborer.....
11	" 9	" 26	do ..	do do	Frank Kolic.....	Laborer.....
12	" 10	" 18	do ..	do do	Gordon Wilson...	Repair man...
13	" 10	" 19	do ..	do do	M. Atkinson.....	Stove tender...
14	" 22	April 3	do ..	do do	Joseph Fis.....	Keeper.....
15	" 24	" 4	do ..	do do	S. Socla.....	Laborer.....
16	" 26	" 14	do ..	do do	J. Jasansky.....	Keeper.....
17	April 2	" 14	do ..	do do	T. E. Bell.....	Mechanic.....
18	" 12	May 5	do ..	do do	S. Walicki.....	Keeper.....
19	" 29	" 8	do ..	do do	S. Gawant.....	Helper.....
20	May 5	" 13	do ..	do do	Peter Korah.....	Helper.....
21	" 12	" 26	do ..	do do	J. Wornort.....	Laborer.....
22	" 17	.....	do ..	do do	Henry Knox.....	Pipe fitter.....
23	June 3	June 13	do ..	do do	M. Longo.....	Water tender..
24	" 6	" 15	do ..	do do	R. Bolechione....	Laborer.....
25	" 14	" 21	do ..	do do	Kelly Ely.....	Pipe fitter.....
26	" 20	" 28	do ..	do do	G. Pasianito.....	Laborer.....
27	" 29	July 14	do ..	do do	Yam Birloska....	Helper.....
28	" 29	" 14	do ..	do do	Joe Pettenuso....	Fireman.....
29	July 12	" 20	do ..	do do	Ed. Lawler.....	Pipe fitter.....
30	" 22	Aug. 2	do ..	do do	Herb. Hamilton..	Water tender..
31	" 25	" 4	do ..	do do	Paul Rsepa.....	Laborer.....
32	" 27	" 17	do ..	do do	P. Sacripanti.....	Pourer.....
33	Aug. 27	Oct. 30	do ..	do do	W. Sczesny.....	Helper.....
34	Sept. 5	" 6	do ..	do do	Kelly Ely.....	Pipe fitter.....
35	" 5	Sept. 29	do ..	do do	A. Golassi.....	Laborer.....
36	" 18	.....	do ..	do do	G. Luni.....	Laborer.....
37	" 23	Oct. 5	do ..	do do	G. Colabianchi...	Keeper.....
38	Oct. 4	" 27	do ..	do do	D. Nigus.....	Laborer.....
39	" 9	Dec. 22	do ..	do do	R. Errington.....	Laborer.....
40	" 21	Oct. 29	do ..	do do	P. Sabatino.....	Pourer.....
41	" 21	" 28	do ..	do do	A. Digasparo.....	Foreman.....
42	Nov. 11	Nov. 19	do ..	do do	S. Snizek.....	Keeper.....
43	" 19	.....	do ..	do do	B. Sacrapenti....	Pourer.....
44	" 30	Jan. 2	do ..	do do	R. Zorzi.....	Laborer.....
45	Dec. 9	" 15	do ..	do do	Ed. Lawler.....	Blower.....
46	" 13	Dec. 29	do ..	do do	Jas. Nicholson...	Millwright....
47	" 21	" 30	do ..	do do	J. Jasensky.....	Keeper.....
48	Jan. 7	Jan. 20	Smelter.....	Canadian Copper Co...	P. Elspidia.....	Laborer.....
49	" 8	Feb. 26	do ..	do do	J. Latasky.....	Laborer.....
50	" 10	Jan. 26	do ..	do do	H. Jackson.....	Engineer.....
51	" 16	" 24	do ..	do do	W. Todman.....	Fitter.....
52	" 17	Feb. 3	do ..	do do	F. Seneridye.....	Laborer.....
53	" 18	" 13	do ..	do do	T. Emilio.....	Tapper.....
54	" 18	" 24	do ..	do do	T. Pietro.....	Laborer.....

## at Metallurgical Works, 1913.

Nationality of Injured.	Age.	Married or single.	Number injured.	Nature and Cause of Accident.
Pole.....	18	S	1	Bucket of scrap swung around and struck foot, breaking toe.
Italian.....	22	S	1	Struck on head by falling bar.
Italian.....	20	S	1	Slipped and fell between two cars, bruising neck.
English-speaking.....	.....	M	1	Slipped into hole and sprained ankle.
Italian.....	32	M	1	Iron in mould exploded and burned hand.
Italian.....	29	S	1	Eye burned while pulling bar out of iron notch.
Italian.....	29	S	1	Particle of cinder blown in eye.
Austrian.....	18	S	1	Splash from iron struck him in eye.
Italian.....	38	.....	1	Fell from platform and broke collar-bone.
Pole.....	38	.....	1	Fell and cut eye.
Pole.....	45	.....	1	Iron splashed and burned neck when lifting gate.
English-speaking.....	.....	M	1	Jack screw broke and cylinder fell on him, cutting lip.
English-speaking....	26	S	1	Bar slipped and struck him in stomach.
Pole.....	25	S	1	Hand burned by hot iron.
Pole.....	45	M	1	Cut finger on wheelbarrow.
Pole.....	25	S	1	Collar on cooler broke, crushing finger.
English-speaking....	38	M	1	Weight fell on finger, breaking it.
Pole.....	22	S	1	Leg burned while tapping furnace.
Pole.....	28	S	1	Finger cut by sheet iron.
Austrian.....	.....	M	1	Wrenched shoulder while drilling iron notch.
Pole.....	22	S	1	Foot bruised by piece of cinder dropped from crane.
English-speaking....	20	S	1	Finger jammed while repairing pump.
Italian.....	25	S	1	Foot scalded while blowing out boiler tubes.
Italian.....	19	S	1	Piece of scrap fell off barrow on foot.
English-speaking....	25	M	1	Balance weight fell on foot.
Italian.....	32	M	1	Lever fell on foot, bruising same.
Pole.....	20	S	1	Right arm and side burned; iron blew out of notch.
Italian.....	22	S	1	Struck by piece of scrap and ankle sprained.
English-speaking....	30	M	1	Hand cut while changing tuyere.
English-speaking....	19	S	1	Fell from bussel pipe while gassed.
Pole.....	30	M	1	Foot bruised by chain falling on it.
Italian.....	25	S	1	Burned on back and hips by splashed iron.
Pole.....	21	S	1	Forearm burned by falling penstock.
English-speaking....	25	M	1	Fell from platform and cut skull.
Italian.....	26	S	1	Furnace slipped and hot stock burned head and hand.
Italian.....	44	M	1	Foot burned while cleaning out hearth.
Italian.....	23	S	1	Badly burned while drilling out iron notch.
Italian.....	18	S	1	Furnace slipped and splashed metal in face.
English-speaking....	25	S	1	Slipped from gangway and sprained ankle.
Italian.....	22	S	1	Eye burned by spark of hot metal.
Italian.....	25	M	1	Hand crushed between cars.
Pole.....	.....	M	1	Eye injured by spark of iron.
Italian.....	26	S	1	Metal splashed on foot.
Italian.....	38	M	1	Fell from car and sprained wrist.
English-speaking....	31	M	1	Puller slipped and injured head.
English-speaking....	55	M	1	Head injured by falling wedge.
Pole.....	46	M	1	Foot burned while drilling out notch.
Italian.....	19	S	1	Fell from gangway and injured side.
Pole.....	29	S	1	Foot jammed between motor and rail.
English-speaking....	30	M	1	Leg sprained by jumping from cab to escape slag.
English-speaking....	32	S	1	Fell into elevator pit and injured leg.
Pole.....	19	S	1	Slipped on ice and cut hand.
Italian.....	32	M	1	Burned through leakage from tuyere.
Italian.....	46	M	1	Fell on ice and injured ankle.

Table of Non-Fatal Accidents at

No.	Date of Accident.	Date of Recovery.	Name of Works.	Name of Owner.	Name of Injured.	Occupation of Injured.
55	Jan. 23	Feb. 3	Smelter.....	Canadian Copper		
56	" 29	" 17	do .....	Co.....	E. Johnston....	Fitter.....
57	" 30	" 18	do .....	do do	P. Luigi.....	Mason.....
				do do	W. Light.....	Engineer.....
58	Feb. 3	" 12	do .....	do do	B. Enrico.....	Laborer.....
59	" 3	" 12	do .....	do do	G. Davidson....	Laborer.....
60	" 4	" 12	do .....	do do	Z. Guiseppa....	Laborer.....
61	" 6	June 23	do .....	do do	J. B. Wylie.....	Lineman.....
62	" 11	May 12	do .....	do do	G. Cassidy.....	Brakeman.....
63	" 11	Feb. 24	do .....	do do	M. Diku.....	Laborer.....
64	" 12	Mar. 12	do .....	do do	S. Sarcangelo...	Laborer.....
65	" 15	" 24	do .....	do do	F. Luigi.....	Laborer.....
66	" 17	" 31	do .....	do do	F. Switch.....	Foreman.....
67	" 18	" 2	do .....	do do	C. Metro.....	Brakeman.....
68	" 21	" 10	do .....	do do	F. Ludivina....	Laborer.....
69	" 26	Ap'l 14	do .....	do do	D. Paterina....	Laborer.....
70	" 26	Mar. 6	do .....	do do	C. Eugenio.....	Laborer.....
71	" 27	" 28	do .....	do do	C. Grossatto....	Laborer.....
72	" 28	" 11	do .....	do do	B. Antonio.....	Laborer.....
73	Mar. 1	" 13	do .....	do do	J. Pytyle.....	Laborer.....
74	" 5	Ap'l 21	do .....	do do	J. Boiullia....	Motorman.....
75	" 5	Mar. 18	do .....	do do	P. Twanschak...	Laborer.....
76	" 5	" 25	do .....	do do	J. Koreski.....	Laborer.....
77	" 8	" 16	do .....	do do	P. Rogass.....	Laborer.....
78	" 16	" 24	do .....	do do	T. Vittorio....	Laborer.....
79	" 18	" 31	do .....	do do	G. Liugraine....	Laborer.....
80	" 19	" 31	do .....	do do	M. Oskrowske...	Laborer.....
81	" 19	April 2	do .....	do do	C. Angelo.....	Laborer.....
82	" 19	May 14	do .....	do do	C. Luigi.....	Laborer.....
83	" 20	Ap'l 14	do .....	do do	N. Laurie.....	Fitter.....
84	" 21	" 1	do .....	do do	G. Miller.....	Brakeman.....
85	" 21	" 7	do .....	do do	W. Boyd.....	Foreman.....
86	" 21	Mar. 29	do .....	do do	L. Bacowski....	Carpenter.....
87	" 10	Ap'l 14	do .....	do do	J. Oksalo.....	Fitter.....
88	" 14	Mar. 31	do .....	do do	D. Finn.....	Tapper.....
89	" 25	Ap'l 3	do .....	do do	T. Antonio.....	Laborer.....
90	" 28	" 14	do .....	do do	G. Hudson.....	Blacksmith....
91	Ap'l 3	" 21	do .....	do do	M. Enrico.....	Laborer.....
92	" 3	" 24	do .....	do do	R. Calomini....	Fitter.....
93	" 4	July 9	do .....	do do	D. Angelo.....	Laborer.....
94	" 5	Ap'l 15	do .....	do do	A. Waulff.....	Skimmer.....
95	" 15	" 28	do .....	do do	T. Edyvear....	Fitter.....
96	" 16	May 2	do .....	do do	J. Robertson....	Helper.....
97	" 16	Ap'l 23	Crushing plant.	do do	G. Bojuk.....	Laborer.....
98	" 21	May 1	Smelter.....	do do	P. Dykonicki...	Laborer.....
99	" 22	Oct. 1	Roast yard.....	do do	J. Papaluka....	Laborer.....



## Metallurgical Works, 1913.—Continued.

Nationality of Injured.	Age.	Married or single.	Number injured.	Nature and cause of accident.
English-speaking. . .	30	S	1	Hand drawn into drill and fingers injured.
Italian. . . . .	27	S	1	While carrying plank fell and sprained back.
English-speaking. . .	23	S	1	Cut wrist on glass while washing cab windows.
Italian. . . . .	27	S	1	Struck by timber while loading car.
English-speaking. . .	19	S	1	Eye burned by explosion of matte.
Italian. . . . .	25	S	1	Piece of timber fell on foot while loading boiler.
English-speaking. . .	29	S	1	Fell from top of pole to ground, due to receiving shock.
English-speaking. . .	30	M	1	While getting down from tender of locomotive slipped and fell between tender and car and leg amputated.
Pole. . . . .	39	M	1	Piece of matte he was carrying fell on his foot.
Italian. . . . .	24	S	1	Piece of slag shell from pot rolled on foot.
Italian. . . . .	32	S	1	Fell out of car and injured back.
English-speaking. . .	33	M	1	Fell from car as it was being shunted and injured hip and head.
Pole. . . . .	19	S	1	Struck by locomotive and legs bruised.
Italian. . . . .	23	S	1	Fell on ice and bruised arm.
Italian. . . . .	28	S	1	Foot caught between brakebeam and car truck.
Italian. . . . .	42	M	1	Fell and sprained wrist.
Italian. . . . .	27	S	1	Matte exploded as it was being poured and foot burned.
Italian. . . . .	56	S	1	Sprained back while putting car on track.
Pole. . . . .	37	M	1	Foot burned while pouring ladle of matte.
Italian. . . . .	36	S	1	Motor collided with car and hand cut.
Pole. . . . .	27	S	1	Hand caught in chain of coal belt and thumb cut.
Pole. . . . .	37	S	1	Hand injured by slag pot.
Pole. . . . .	23	S	1	Foot burned by slag.
Italian. . . . .	35	S	1	Head came off hammer and struck his side.
Italian. . . . .	19	S	1	Hand injured by piece of coke falling on it.
Pole. . . . .	22	S	1	Head burned by explosion while breaking skull.
Italian. . . . .	31	.....	1	Foot bruised by iron plate falling on it.
Italian. . . . .	31	.....	1	Foot bruised by pipe falling on it.
Finn. . . . .	26	S	1	Finger jammed between plates.
English-speaking. . .	18	S	1	Leg jammed between motor and car.
English-speaking. . .	49	M	1	Slipped and sprained ankle.
Pole. . . . .	32	.....	1	Slipped and sprained ankle.
Finn. . . . .	37	M	1	Finger amputated by being caught between door and side of furnace.
Finn. . . . .	37	M	1	Heel burned by matte while tapping furnace.
Italian. . . . .	26	S	1	Explosion occurred while shelling slag pot.
English-speaking. . .	31	M	1	Scale of hot iron struck hand.
Italian. . . . .	32	S	1	While unloading steel chute from car it slipped and struck him.
Finn. . . . .	28	S	1	Fingers jammed while connecting pipe line.
Italian. . . . .	29	M	1	Slipped on ice and injured hip.
English-speaking. . .	26	M	1	Fell through skimming hole in converter floor.
English-speaking. . .	28	S	1	Eyes injured by dust from furnace valve.
English-speaking. . .	27	S	1	Finger jammed by boiler plate.
Pole. . . . .	35	S	1	Fell from car.
Pole. . . . .	23	S	1	Fingers injured in gears of slag pot.
Pole. . . . .	26	S	1	Struck by ties and leg broken when engine struck car.

Table of Non-Fatal Accidents at

No.	Date of Accident.	Date of Recovery.	Name of Works.	Name of Owner.	Name of Injured.	Occupation of Injured.
100	Ap'l 24	May 8	Smelter.....	Canadian Copper Company.....	P. Eugenio.....	Laborer.....
101	" 26	June 4	do .....	do do	J. Boweis.....	Laborer.....
102	" 29	July 7	Crushing plant.	do do	G. Giovanni.....	Laborer.....
103	" 30	May 10	Stockyard.....	do do	S. Signoretti.....	Laborer.....
104	May 3	" 12	Smelter.....	do do	A. Pic .....	Laborer.....
105	" 3	" 26	do .....	do do	V. Deloni.....	Laborer.....
106	" 3	" 12	do .....	do do	J. Ikaraloka....	Laborer.....
107	" 4	June 2	do .....	do do	M. Domenico.....	Laborer.....
108	" 4	May 22	do .....	do do	V. Pietro.....	Laborer.....
109	" 6	" 14	do .....	do do	H. Cuezina.....	Laborer.....
110	" 6	" 19	do .....	do do	G. Taylor.....	Laborer.....
111	" 10	" 17	do .....	do do	M. Paprenick....	Laborer.....
112	" 13	June 13	do .....	do do	M. Steajka.....	Laborer.....
113	" 15	" 2	do .....	do do	H. Traverse.....	Brakeman....
114	" 15	" 16	do .....	do do	J. Quansincinojak	Laborer.....
115	" 16	May 23	do .....	do do	F. Klemp.....	Tapper.....
116	" 17	June 26	do .....	do do	J. Hudrga.....	Laborer.....
117	" 20	" 2	do .....	do do	A. Signoretta....	Laborer.....
118	" 21	" 3	do .....	do do	L. Angelo.....	Laborer.....
119	" 24	" 1	do .....	do do	Z. Luigi.....	Laborer .....
120	" 26	" 26	do .....	do do	O. Trottier .....	Carpenter ...
121	" 26	" 4	do .....	do do	M. Baby .....	Tuyere p'nch'r
122	" 26	Dec. 2	Crushing plant	do do	H. Silvestri .....	Laborer .....
123	" 29	June 23	Smelter.....	do do	D. Tonuto .....	Laborer .....
124	June 2	" 10	do .....	do do	J. Dmytre .....	Carter .....
125	" 6	Perm'ly Disabled	do .....	do do	W. Polinski.....	Brakeman ...
126	" 9	Aug. 11	do .....	do do	P. Cozoriz .....	Laborer .....
127	" 10	June 18	do .....	do do	O. Rauta .....	Fitter .....
128	" 12	" 23	do .....	do do	A. Morelli .....	Laborer .....
129	" 13	" 23	do .....	do do	M. Angelo .....	Laborer .....
130	" 16	" 30	do .....	do do	S. Domenick ....	Laborer .....
131	" 16	" 30	do .....	do do	J. Gault .....	Carpenter ...
132	" 18	.....	Crushing plant	do do	W. Janick .....	Laborer .....
133	" 21	July 7	Smelter.....	do do	D. Finn .....	Tapper .....
134	" 21	Aug. 18	do .....	do do	J. Thomas .....	Fitter .....
135	" 25	.....	do .....	do do	G. Fairbairn ....	Engineer ....
136	" 25	July 14	do .....	do do	D. Tierney .....	Fitter .....
137	" 26	Aug. 6	do .....	do do	A. Bossack .....	Foreman ....
138	" 28	July 15	do .....	do do	M. Striko .....	Laborer .....
139	July 2	" 17	do .....	do do	M. Oskrowska ..	Tuyere p'nch'r
140	" 4	" 12	do .....	do do	B. Luigi .....	Laborer .....
141	" 4	" 15	do .....	do do	F. Minta .....	Laborer .....
142	" 5	" 28	do .....	do do	J. Martin .....	Brakeman ...
143	" 8	" 20	do .....	do do	T. Gletchineto...	Laborer .....
144	" 19	" 29	do .....	do do	L. Zenelea .....	Mechanic ....
145	" 23	Aug. 5	do .....	do do	S. Bahonen .....	Laborer .....
146	" 24	" 6	do .....	do do	J. Francesco .....	Helper .....
147	" 25	" 4	do .....	do do	J. Garalaki .....	Laborer .....
148	" 26	" 12	do .....	do do	L. Patrini .....	Laborer .....
149	" 28	" 20	do .....	do do	C. Giovanni .....	Laborer .....
150	" 31	" 11	do .....	do do	S. Builing .....	Carpenter ...
151	" 31	Nov. 30	do .....	do do	Z. Makki .....	Driller .....
152	Aug. 6	Aug. 18	do .....	do do	E. Travers .....	Fitter .....

## Metallurgical Works, 1913.—Continued.

Nationality of Injured.	Age.	Married or single.	Number Injured.	Nature and Cause of Accident.
Italian.....	26	S	1	Hand cut by piece of converter slag.
English-speaking. . .	17	S	1	Finger cut on band-saw.
Italian.....	30	S	1	Arm crushed between spider of trommel and beam.
Italian.....	25	S	1	Pricked finger with iron strap on handle of coke fork.
Pole.....	31	S	1	Neck burned by hot calcines.
Italian.....	29	S	1	Fingers jammed between cogs of matte pot.
Finn.....	26	M	1	Stepped on nail.
Italian.....	19	S	1	Fell about 10 feet into bin.
Italian.....	27	S	1	Fingers jammed between pieces of ore.
Pole.....	22	S	1	Head cut by piece of ore falling from car.
English-speaking. . .	28	S	1	Foot bruised by iron plate.
Pole.....	31	S	1	Face burned by explosion of contents of ladle.
Pole.....	32	S	1	Eye burned by hot metal.
English-speaking....	22	S	1	Foot bruised when locomotive left rail.
Pole.....	36	S	1	Finger crushed between two pieces of rock.
German.....	46	M	1	Nose broken by being struck with hammer.
Pole.....	28	M	1	Foot crushed by moving platform.
Italian.....	27	S	1	Foot crushed while moving machinery from car.
Italian.....	25	S	1	Toes bruised by car running over foot.
Italian.....	31	S	1	Arm bruised by conveyor belt.
English-speaking....	41	M	1	Hand cut by rip saw.
Pole.....	21	S	1	Wrenched shoulder while chipping stock of converter.
Italian.....	18	S	1	Fell from ladder and broke leg.
Italian.....	27	S	1	Foot burned by hot slag.
Pole.....	28	M	1	Piece of roofing struck him on head.
Pole.....	22	S	1	Fell off locomotive and both legs amputated.
Pole.....	40	S	1	Ankle bruised between two cars.
Finn.....	32	M	1	Flue dust blown in eyes.
Italian.....	21	S	1	Fell off scaffold and injured side.
Italian.....	26	S	1	Struck by door of coal car.
Italian.....	24	S	1	Piece of matte fell on foot.
English-speaking....	28	M	1	Fell 12 feet and injured back.
Pole.....	45	M	1	Arm broken by being caught in coupling of shaft.
Finn.....	24	S	1	Finger injured by being struck with hammer.
English-speaking....	24	S	1	Finger amputated between cable and sheave.
English-speaking....	60	S	1	Fell into round-house pit and bruised knee.
English-speaking....	39	M	1	Hand injured while cutting rivets.
English-speaking....	37	M	1	Foot crushed under spout.
Pole.....	33	S	1	Foot burned by metal.
Pole.....	27	S	1	Burnt by splash of slag while punching tuyere.
Italian.....	24	S	1	Slipped from platform and sprained ankle.
English-speaking....	21	S	1	Hand injured while cutting rivets.
English-speaking....	24	S	1	Slipped on stone and sprained ankle.
Pole.....	25	S	1	Hand cut by piece of slag.
Italian.....	27	S	1	Slipped and injured side.
Finn.....	39	S	1	Cut head against steam shovel frame.
Italian.....	37	M	1	Struck on neck by piece of slag.
Pole.....	29	S	1	Arm burned by hot calcines.
Italian.....	32	S	1	Hand bruised by fall.
Italian.....	34	M	1	Finger pinched by car.
Swede.....	26	S	1	Foot bruised by piece of concrete.
Finn.....	30	S	1	Hand bruised by hammer.
English-speaking....	21	S	1	Fell 8 feet and bruised foot.

Table of Non-Fatal Accidents at

No.	Date of Accident.	Date of Recovery.	Name of Works.	Name of Owner.	Name of Injured.	Occupation of Injured.
153	Aug. 9	Sept. 1	Smelter.....	Canadian Copper Company.....	T. Frederico ....	Cleaner .....
154	" 9	Aug. 18	do .....	do do	J. Brindley .....	Engineer .....
155	" 12	" 26	do .....	do do	C. Pilate .....	Laborer .....
156	" 14	" 27	do .....	do do	B. Giovanni .....	Laborer .....
157	" 15	" 22	do .....	do do	P. Albino .....	Cleaner .....
158	" 16	" 30	do .....	do do	G. Otrotoni .....	Laborer .....
159	" 18	" 29	do .....	do do	J. Kcaruz .....	Laborer .....
160	" 20	Sept 6	do .....	do do	L. Domenic .....	Laborer .....
161	" 23	" 3	do .....	do do	L. Nozzoreno .....	Helper .....
162	" 24	Nov. 3	do .....	do do	E. Gregorcheff .....	Laborer .....
163	" 25	Sept. 4	do .....	do do	G. Bruce .....	Teamster ....
164	" 27	" 5	do .....	do do	D. Lenio .....	Laborer .....
165	Sept. 1	" 13	do .....	do do	N. Soposki .....	Feeder .....
166	" 4	Nov. 18	do .....	do do	H. Bethel .....	Carpenter ....
167	" 6	Sept. 15	do .....	do do	F. Scarneki .....	Laborer .....
168	" 6	" 22	do .....	do do	D. Lampi .....	Laborer .....
169	" 8	Jan. 8 '14	do .....	do do	T. Guiseppi .....	Cleaner .....
170	" 10	.....	do .....	do do	G. McKenzie .....	Helper .....
171	" 15	Oct. 13	do .....	do do	H. Meyers .....	Driver .....
172	" 18	" 4	do .....	do do	I. Newell .....	Helper .....
173	" 22	" 10	do .....	do do	N. Kryzowsky .....	Laborer .....
174	" 25	" 7	do .....	do do	S. Gresanowski .....	Laborer .....
175	" 30	.....	do .....	do do	J. Blackwell .....	Fitter .....
176	Oct. 8	Dec. 15	do .....	do do	R. Strutt .....	Electrician ..
177	" 17	" 10	do .....	do do	I. Luigi .....	Laborer .....
178	" 21	.....	do .....	do do	T. Regusz .....	Laborer .....
179	" 22	Nov. 18	do .....	do do	G. Boyuck .....	Laborer .....
180	Nov. 25	Dec. 12	do .....	do do	V. Engera .....	Laborer .....
181	Dec. 19	Feb. 16	do .....	do do	R. Hryrto .....	Tuyere p'nch'r
182	Mar. 7	May 1	Ore piles .....	Canada Iron Corporation..	O. Somers .....	Laborer .....
183	" 27	Ap'l 10	Blast furnace .	do do	R. Tannahill .....	Blower .....
184	June 14	.....	do .....	do do	R. Robbins .....	Machine runner
185	Feb. 1	Feb. 10	Arsenic plant .	Coniagas Reduction Co., Ltd..	P. Jones .....	Laborer .....
186	Mar. 6	Mar. 15	Yard .....	do do	J. Vascla .....	Laborer .....
187	" 8	" 19	Furnace building	do do	D. Marchi .....	Cupeller .....
188	May 27	June 16	Shops .....	do do	H. Putman .....	Carpenter .....
189	June 6	" 16	Furnace building	do do	E. Bellio .....	Laborer .....
190	July 19	.....	Blast furnace ..	do do	J. Logue .....	Laborer .....
191	Aug. 18	Aug. 25	Power plant ..	do do	G. Storms .....	Millwright....
192	Aug. 30	Sept. 15	Milling plant ..	Deloro Mining and Reduction Co., Ltd.....	A. Kotch .....	Laborer .....
193	Feb. 2	Feb. 26	Smelter .....	Mond Nickel Co.	V. Formunch .....	Laborer .....
194	" 17	Mar. 29	do .....	do do	T. Hydook .....	Laborer .....
195	Mar. 14	Ap'l 14	Roast yard ...	do do	E. Gratto .....	Laborer .....
196	Ap'l 10	" 18	do .....	do do	O. Dundas .....	Laborer .....
197	June 27	Aug. 21	Smelter .....	do do	E. Piovesan .....	Helper .....
198	Ap'l 17	.....	Blast furnace }	North American	E. Crellian .....	Laborer .....
199	July 8	.....	do }	Smelting Co..	F. Waite .....	Laborer .....
200	Jan. 8	Jan. 18	Blast furnace }	Steel Company	C. Cesare .....	Laborer .....
201	Feb. 26	Ap'l 28	do }	of Canada....	B. Guisseppi .....	Laborer .....



## Metallurgical Works, 1913,—Concluded.

Nationality of Injured	Age.	Married or single.	Number Injured.	Nature and Cause of Accident.
Italian.....	56	M	1	Face, shoulders and back burned by splash of matte.
English-speaking....	38	M	1	Ear cut and blood poisoning resulted.
Italian.....	33	S	1	Pinch bar slipped and jammed finger.
Italian.....	30	S	1	Blocking slipped, bruising toes.
Italian.....	28	S	1	Nail ran into foot.
Italian.....	39	S	1	Casting fell against leg.
Pole.....	31	S	1	Foot bruised by piece of slag falling on it.
Italian.....	26	S	1	Foot bruised by piece of matte falling on it.
Italian.....	29	M	1	Piece of steel injured eye.
Pole.....	31	S	1	Slag pot ran over foot.
English-speaking....	22	S	1	Pipe fell on ankle, bruising same.
Italian.....	18	S	1	Iron plate fell on foot.
Pole.....	31	S	1	Head struck with furnace door weights.
English-speaking....	38	M	1	Fingers injured by splinter.
Italian.....	24	S	1	Fell and injured eye.
Finn.....	22	S	1	Hand burned by piece of hot coke.
Italian.....	27	S	1	Foot and hand jammed between crane and building.
English-speaking....	24	S	1	Clothing caught in shafting of emery wheel.
English-speaking....	22	S	1	Struck knee against truck.
English-speaking....	31	M	1	Finger torn by piece of screen.
Pole.....	22	S	1	Fell and struck head.
Pole.....	28	S	1	Rail slipped and fell on foot.
English-speaking....	21	S	1	Piece of pipe fell and bruised foot.
English-speaking....	19	S	1	Foot caught in conveyor and bruised.
Italian.....	23	S	1	Clothing caught in ash pan and arm broken.
Pole.....	32	M	1	Piece of matte fell and bruised toe.
Pole.....	27	S	1	Finger hit with hammer.
Pole.....	23	S	1	Hammer slipped and struck leg.
Pole.....	40	S	1	Slipped and cut leg.
English-speaking....	27	M	1	Jaw fractured and ear torn off while blasting in ore pile.
English-speaking....	38	M	1	Burned by metal.
English-speaking....	52	M	1	Fell from platform and injured hip.
English-speaking....	34	S	1	Door fell on foot injuring toe.
Roumanian.....	32	M	1	Wrist cut by piece of slag.
Italian.....	19	S	1	Struck by pot handle while dumping pot.
English-speaking....	28	M	1	Finger amputated by buzz planer.
Italian.....	18	S	1	Leg burned by hot slag.
English-speaking....	34	M	1	Fell into No. 3 ore bin, breaking leg in 3 places.
English-speaking....	30	M	1	Back injured while moving machinery
Pole.....	.....	.....	1	Chest crushed by platform elevator descending.
Austrian.....	45	.....	1	Slipped while dumping barrow and fractured 3 ribs.
Austrian.....	31	.....	1	Struck by piece of frozen ground and leg broken.
Italian.....	30	M	1	Fell from aerial tramway and broke small bone of leg.
Austrian.....	45	M	1	Slipped and fractured rib.
Italian.....	20	S	1	Fell 16 feet on slag track and broke arm.
English-speaking....	.....	S	.....	Foot burned by slag.
English-speaking....	25	S	1	Hip injured by truck of pig lead falling.
Italian.....	24	S	1	Hand burned by slag.
Italian.....	28	M	1	Struck by shovel and eye lacerated.

### Accidents at Quarries.

Under this heading are classified the accidents that occur in all kinds of stone quarries, gravel pits, and excavations at brick yards and cement works. During the year 1913, seven fatal accidents resulting in the death of eight men, and eleven non-fatal accidents resulting in injuries to twelve men, were reported to this office from such works.

At the Dill quartz quarry, operated by the Canadian Copper Company, a trammer was killed by being struck by a falling stone from the bank. The stone that fell had been embedded in the subsoil and had been loosened by heavy rains on the night previous to the accident.

A laborer in the gravel pit of the York Sand and Gravel Company at East Toronto jumped on the platform in front of the revolving crane and was instantly killed.

A laborer at the Vinemount quarry of the Wentworth Quarry Company was killed when the shovel tipped over while being moved. The engineer was absent at the time, and the craneman attempted to move the shovel.

A laborer was killed in the gravel pit of the Clifton Sand and Gravel Company, near Stamford, by being picked up in the clam shell. The accident was due to the fact that there was not any signal-man on duty at the edge of the pit to see that no person came near the clam. From his position on the derrick, the engineer could not see the clam when loading.

A contractor working in the clay pit of the A. H. Wagstaff's brick works, Greenwood Ave., Toronto, was killed by a fall of clay, on April 4th. This accident was due to the men taking a chance and not waiting till the bank cleaned itself.

Two men were killed at the Intercities Quarry, Port Arthur, by a premature explosion while loading a hole. The explosive used was gelignite (undated), and the explosion was probably the result of using unnecessary force while loading the hole with chilled powder.

A laborer was killed by a fall of clay in the clay pit of Ollman Bros.' brick works at Hamilton. The man was a Russian who understood very little English, and it is probable that the accident was due to his misunderstanding the foreman's orders.

The occupation of the men killed at quarries and their nationalities are shown in the following table:—

Occupation.	English Speaking.	Italian.	Roumanian.	Finn.	Russian.	Total.
Trammer.....		1				1
Laborer.....	2		1		1	4
Powderman.....				1		1
Helper.....				1		1
Contractor.....	1					1
Total.....	3	1	1	2	1	8

The ages of the men killed at the quarries were as follows:—

20-25	26-30	36-40	41-45	46-50	51-55	56-60	Total.
3	1	1	2	0	0	1	8

The following shows the causes of the fatalities at the quarries.

	1912.	1913.
Struck by bucket of dredge .....	1	0
Struck by material from bank .....	0	3
Premature explosion .....	0	2
Picked up in clam shell .....	0	1
Crushed by machinery .....	0	2
Total . . . . .	1	8

Table of Fatal Accidents

Number.	Date, 1913.	Name of Works.	Name of Owner.	Name of De- ceased.	Occupation of Deceased.
1	Jan. 17	Dill Quartz.....	Canadian Copper Co..	B. Giovanni....	Trammer.....
2	Mar. 22	Sand pit.....	Clifton Sand and Gravel Co. ....	J. Papin.....	Laborer.....
3	April 7	Quarry.....	Intercities Quarry Co..	E. Peltó.....	Powderman....
	" 7	do .....	do do	J. Sessila.....	Helper.....
4	May 6	Brick-yard.....	Ollman Bros. ....	Louis Tures...	Laborer.....
5	April 4	do .....	A. H. Wagstaff.....	Geo. Jones ....	Contractor....
6	Feb. 21	Quarry.....	Wentworth Quarry Co.	Pat. McGrath..	Laborer.....
7	Feb. 11	Gravel pit.....	York Sand and Gravel Co. ....	W. Forsyth....	Laborer.....

Table of Non-Fatal Acci-

Number.	Date of Accident.	Date of Recovery.	Name of Works.	Name of Owner.	Name of Injured.	Occupation of Injured.
1	July 11	July 30	Clay pit....	Breslau Brick Co. ....	Castturat Mi..	Laborer.....
2	Nov. 29	.....	Quarry.....	Canada Cement Co. ....	Ben Weese....	Powderman....
	" 29	.....	do ....	do do	T. Nikola.....	Drill Helper...
3	Jan. 28	Mar. 4	Dill quartz.	Canadian Copper Co..	D. Delacco....	Trammer.....
4	Feb. 4	Mar. 24	do . do	do do	Z. Vitoria.....	Trammer.....
5	Mar. 16	April 5	do . do	do do	P. Cavassino...	Trammer.....
6	July 29	Aug. 11	do . do	do do	T. Arturo.....	Trammer.....
7	Sept. 13	Sept. 30	Quarry.....	Canada Crushed Stone Corporation .....	Jos. Oates....	Craneman.....
8	Nov. 18	Jan. 3	do ...	Hagersville Contract- ing Co. ....	A. Pignatello..	Driver.....
9	May 16	.....	do ....	Ontario Rock Co. ....	D. Naibeff....	Trammer.....
10	Dec. 6	.....	do ....	do do	O. Sanders.....	Trammer.....
11	April 26	May 12	Clay pit....	Sun Brick Co. ....	F. Livcola.....	Laborer.....



## at Quarries, 1913.

Nationality of Deceased.	Age.	Married or Single.	In Quarry.	Outside Quarry.	Nature and Cause of Accident.
Italian.....	22	S	1	.....	Struck on head by falling stone from bank.
Roumanian.....	58	M	1	.....	Picked up in clam-shell.
Finn.....	25	M	1	....	Premature explosion while loading holes.
Finn.....	30	S	1	.....	
Russian.....	38	S	1	.....	Crushed by falling clay.
English-speaking....	43	M	1	.....	Buried under fall of clay.
English-speaking....	45	S	1	.....	Crushed under steam shovel which tipped while moving.
English-speaking....	22	S	.....	1	Crushed between revolving crane platforms.
Total.....	.....	.....	7	1	

## dents at Quarries, 1913.

Nationality of Injured.	Age.	Married or Single.	Number Injured.	Nature and Cause of Accident.
Italian.....	21	S	1	Leg broken by fall of clay.
English-speaking.....	34	M	2	Numerous cuts and bruises, premature blast.
Hungarian.....	35	M	....	
Italian.....	35	S	1	Tripped and sprained ankle.
Italian.....	42	M	1	Knee bruised, struck by derrick boom.
Italian.....	28	S	1	Leg jammed between log and stump.
Italian.....	18	S	1	Finger crushed under roller, while moving hoist.
English-speaking.....	29	S	1	Finger cut off, while repairing crane.
Italian.....	17	S	1	Leg broken below knee, riding on loaded car.
Macedonian.....	24	M	1	Struck in eye by piece of rock while sledging
English-speaking.....	18	S	1	Hand cut by piece of flying rock.
Italian.....	21	S	1	Back injured by piece of wood, while blasting on surface.

## MINES OF ONTARIO

By T. F. SUTHERLAND, CHIEF INSPECTOR OF MINES

### I.—NORTHWESTERN ONTARIO

There was no improvement in mining conditions in northwestern Ontario during 1913 compared with the previous two years as regards the number of properties working.

The Northern Pyrites mine on Big Vermilion lake was worked continuously throughout the year, and some diamond-drilling was done on adjoining claims in an effort to locate a continuation of the ore body.

In the Lake of the Woods area the Canadian Homestake Company continued development work at the Scramble mine, Jaffray township, west of the town of Kenora.

One or two of the old producing mines in this district were examined during the year by engineers representing companies looking for mining investment.

In the Sturgeon Lake area the St. Anthony gold mine operated during the first part of the year, but, owing to financial difficulties, work was discontinued.

During the latter part of the year several claims were staked in the vicinity of Mine Centre on the Canadian Northern railway west of Port Arthur. Some fine specimens of free gold were obtained, but, owing to the lateness of the season, nothing beyond staking was attempted.

Near Schreiber, east of Port Arthur on the Canadian Pacific railway, there was considerable activity in locating claims during the summer on what was thought to be a new nickel range. Work was confined to the necessary assessment to hold the claims.

The following brick companies are operating during the summer months in the vicinity of Port Arthur and Fort William:

Superior Brick Company, Twin City Junction.  
Alsip Brick and Tile Company, West Fort William.  
Gowanlock Brick Company, West Fort William.  
Sand, Lime Brick Company, Port Arthur.  
Fort William Brick and Tile Company, West Fort William.

#### Northern Pyrites Mine

The Northern Pyrites Company of 25 Broad street, New York, operated their pyrite mine at Northpines throughout the year. Northpines is about eleven miles west of Graham on the Grand Trunk Pacific railway.

During the year new stopes were opened on the second and third levels. These levels were also driven towards the eastern boundary. Preparations were made for sinking the main shaft another 100 feet, where a new level will be opened up both east and west.

In the crusher building a picking belt was installed to facilitate the extraction of quartz from the ore.

The new Leischan aerial tram, two miles in length, connecting the mine and the Grand Trunk Pacific railway, was in operation throughout the year. Of ore, 44,245 long tons were shipped to Buffalo, Chicago and Cleveland.

Mr. R. K. Painter is consulting engineer of the company, and Mr. H. V. Smythe superintendent at the mine, employing 84 men.

#### Canadian Homestake Gold Mine

The Canadian Homestake Gold Mining Company, Limited, head office, Toronto; Treasurer's office, 397 Delaware Avenue, Buffalo, N.Y., are operating the Canadian Homestake mine, formerly known as the Scramble mine. The property comprises an area of 294 acres, lots 13 and 14, concession 6, township of Jaffray, district of Kenora, five miles east of the town of Kenora.

The ore body is a shear zone, between 25 and 30 feet wide on the surface, and is traceable across the property to adjoining locations.

A 3-compartment shaft has been sunk to a depth of 210 feet. A level has been begun at 200 feet, and a cross-cut is also being driven at the same level. From this level connections will be made with No. 2 shaft.

Electric power is used at the mine, this being transmitted from the powerhouse at Kenora under 13,000-volt pressure. The current is stepped down at the mine to 440 volts. The company have a contract with the town of Kenora for 1,200 horsepower for twenty years.

The buildings comprise shaft house, blacksmith shop, dry, assay office and camps. These are heated by both steam and electricity and are lighted by electricity.

The equipment consists of a 600-foot Ingersoll-Rand compound compressor belt driven by a 100-h.p. induction motor. There are in use two 3¼-inch Holman drills, 1 Little Giant-Rand and 6 Ingersoll-Rand hammer drills; a 25-h.p. electric hoist is used for sinking.

The assay office is equipped with motor, crusher, grinder and oil-burning furnaces.

Plans are being prepared for a mill having a daily capacity of 500 tons which will be erected as soon as sufficient tonnage is available to warrant its erection. The mill will be electrically driven.

Mr. Chas. Brent is manager.

### West Beaver Silver Mine

The West Beaver silver mine, 140 T, O'Connor township, Port Arthur Mining Division, is being worked under option by the Trethewey Silver Cobalt Mines, Limited, of Cobalt.

Regarding work at this property, the company, under date February 10th, state as follows:

Work done consisted of erection of buildings, reopening the adit, cutting out and timbering a shaft station on the adit level at the foot of the shaft, the collar of which is 78 feet above the adit level, and sinking the shaft 26 feet below the adit. The shaft is a timbered 2-compartment inclined shaft, with a horse-whim cable and bucket in one compartment and a ladderway in the other. The shaft follows the vein, which has a dip of about 80 degrees and an average width of three feet, consisting of quartz, calcite, fluorite, and very variable amounts of zincblende, galena, argentite, and native silver.

Since the beginning of the current year the shaft has been sunk to 55-foot depth below the adit, which is in slate just under the diabase capping, and a level started at 50 feet. Our intention is to drift to the southwest on the vein at this horizon and to test it by raises at various points.

### Elizabeth Gold Mine

The Elizabeth Gold Mines, Limited, are operating on T.M. 171, Fort Frances Mining Division. This property is situated at the north end of Rice lake, about seven miles from Atikokan, on the Canadian Northern railway.

It is the intention of the company to instal a modern plant.

Mr. R. R. Gamey is president of the company, and Mr. J. P. Williams superintendent at the mine.

### Inter-Cities Quarries

The Inter-Cities Quarries Company, Limited, formerly known as Stewart and Hewitson, are operating a trap rock quarry at Port Arthur. Two pits have been opened up. At the last date of inspection, March 9, 1914, only the north pit was in operation. This was being worked along a 200-foot face and was nearly worked out. The south pit measured approximately 300 feet by 400 feet. From the latter pit the cars are being hauled to the foot of an incline by a Stephens-Adamson car pull, driven by a 7½-h.p. motor. Thence they are hoisted up the incline by a friction hoist, and dumped

into an Allis-Chalmers Gates No. 7½ gyratory crusher, driven by a 100-h.p. motor, which crushes the material to about 4-inch size. The product is delivered by a 30-inch belt conveyor to a hopper. This hopper feeds into a trommel, the oversize going into either a No. 5 Gates gyratory crusher, driven by a 75-h.p. motor, or to a No. 3 Austin gyratory driven by a 30-h.p. motor. The product is loaded into railway cars or wagons as desired, and is used for macadam or concrete work.

Mr. W. M. Colquhoun is manager, and Mr. John Jones foreman. In the summer months 110 men are employed.

### Gowanlock Brick Company

The city of Fort William is operating the properties of the Gowanlock Brick Company at the foot of Mount MacKay, obtaining gravel and boulders for road construction. It is expected that the city quarry proper will soon be put in operation. The work is under the supervision of assistant city engineer Mr. J. Owen. Eleven men are employed.

## II.—SUDBURY and the NORTH SHORE

The year 1913 was a most prosperous one in the history of nickel mining in the Sudbury district. The amount of diamond drilling done was greater than in any previous year since the range opened up, reaching a total of 91,632 feet. The drilling was done systematically and blocked out large bodies of ore for the three companies operating in the field.

The Canadian Copper Company and the Mond Nickel Company are widening their field of operation by developing and prospecting new properties, and by enlarging their smelter plants. The former did extensive development work at the new and largest mine, No. 3, and also increased the capacity of their smelter. The Mond Nickel Company are opening up a large property in Levack township. Drilling was carried on at this property during the summer and fall months, and shafts will be sunk early in 1914. This will likely be the largest ore body owned by the company. Development work was also carried on at the Frood Extension in McKim township, and the Worthington in Drury township. The smelter at Coniston was completed in June and is now operated to its capacity.

The British America Nickel Company, successors to Holmes and Wilson, did considerable work at the smelter site and town site at Nickelton, four miles west of Sudbury, and at Murray mine. With the exception of the Murray mine, however, all operations were closed down for the winter.

Moose Mountain, Limited, operated throughout the year. No. 1 mill ran continuously, while No. 2 mill was in operation about three months. The company did not have power enough to run both plants, and consequently the operation of No. 2 mill had to be curtailed. They are installing a large turbine plant early in 1914. This will furnish sufficient power for all their operations.

The Canadian Exploration Company at Long lake operated continuously throughout the year. The cyanide department was enlarged.

In the West Shining Tree district considerable development work was carried on, and there will likely be one or two small stamp mills in operation before the end of 1914.

Two trap rock quarries were in operation during the year, the International Trap Rock Company at Bruce Mines, and the Huron Trap Rock Company on St. Joseph's Island.

In the Michipicoten district several new properties are being opened up and the Helen and Magpie mines are in operation. After rearranging the plant, the Helen was started early in the fall. The company also did extensive drilling at the Helen and opened up a large body of siderite.



Diamond drills were in operation at the Josephine, Goudreau, and Morrison properties. The Josephine iron mine, which has not been worked for several years, will in all probability be opened up in 1914. The Goudreau pyrite property, owned by the Algoma Steel Corporation, was leased to the Madoc Mining Company. The latter have put up camps and are going ahead with the development work preparatory to mining. The Morrison is a new pyrite property near the Goudreau, and is under option by the Algoma Steel Corporation, who are drilling and prospecting it at present. The power plant at Steep Hill falls, owned by the Lake Superior Power Company, was completed and now furnishes power for the Magpie mine. Some interest was again shown in the Wawa gold district. The Grace mine was pumped out for sampling purposes, and much prospecting and development work was done on some claims north of Wawa.

### Accidents

During the year there were twenty fatal accidents in and around the mines in this area; one at the blast furnaces at Sault Ste. Marie, and five at the smelters, or a total of 26. Compared with 1912, there is an increase of seven fatalities. Although there were more men working in 1913, the additional force was not sufficient to justify the increased number of accidents.

Late in the year, Mr. A. A. MacKay, superintendent of Helen mine in Michipicoten, was appointed Assistant Inspector of Mines for the Sudbury, Michipicoten and Western district.

### Canadian Copper Company

In 1913, as in 1912, nearly all the production of the Canadian Copper Company came from the Creighton, Crean Hill and No. 2 mines. During the latter part of the year, however, there was a small production from No. 3 mine. The larger part of the output came from Creighton mine. Extensive development work was carried on at No. 3 mine on the 200- and 300-foot levels. The company are changing their methods of mining at all their mines, and are doing away with the dry wall drifts. They are using instead a shrinkage system with all the drifts in the solid.

The chief outside improvements were a macadamized road between Copper Cliff and No. 3 mine, and the extensive building of permanent houses at the several properties. At Copper Cliff about 60 good houses were erected during the summer months. At Creighton mine 20 new cottages were erected, and at No. 3 mine houses enough to accommodate 100 families were built. In addition to this, the town at No. 3 mine was incorporated under the name of Frood Mine and has a population of about 1,200.

During the year Mr. John Lawson resigned as president and was succeeded by Mr. A. D. Miles. The officers of the company at present are: Mr. A. D. Miles, president; Mr. B. G. Slaughter, vice-president; Mr. J. L. Agnew, general superintendent; Mr. J. C. Nichols, superintendent of mines; Mr. W. Kent, smelter superintendent; Mr. E. T. Corkill, safety engineer.

The company averaged 2,600 employees in the year 1913.

The appointment of Mr. E. T. Corkill as safety engineer was a step in the right direction, and it is likely other large companies will follow this lead. In fact, the Algoma Steel Corporation at Sault Ste. Marie propose making a similar appointment early in 1914. Since Mr. Corkill's appointment the accidents of the smelter and mines have been reduced by over fifty per cent. and the fatal accidents to a much greater extent. It is to be hoped that all mines will at least appoint a safety committee, especially in view of the increased accidents in 1913.

The company has moved into its new offices near the smelter building; these are of the most modern and well-equipped type. The new hospital at Copper Cliff, a description of which will be found under another heading, will be ready for occupation early in 1914.

A pipe line will be laid from Meat Bird lake to Copper Cliff to supply the town of Copper Cliff with water.

#### Creighton Mine

The larger part of the output of the Canadian Copper Company came from Creighton mine. The main hoisting shaft was sunk and timbered from the fifth to the seventh level, a distance of 233 feet. An ore pocket was cut at the sixth level. A crusher will be placed at the sixth level and all the ore mined on this level will be crushed before going into the pocket. There will also be an ore pass from the fifth level to the sixth. The ore from the fifth level will be drawn through the pass to the sixth level, and will be put through the crusher before being dropped into the pocket. Apart from being a means of taking the ore from the fifth to the sixth level, the ore pass will be used as a storage pocket in case of any delays on surface. All the ore will be hoisted from the sixth level pocket. Placing crushers underground is a new departure in this district, and will no doubt largely increase the output of the mine. There will be no chance of ordinary surface delays hanging up the trammers for any length of time. It will also be much easier to load the skips with a sized product from the ore pocket than with a product that contains lumps. It is estimated that with the new underground equipment the mine can keep up an average daily output of 2,000 tons.

The east ore body on the sixth level has been fully developed and stoping begun. In the new system of mining drifts are driven in the solid ore, raises put up and stopes begun from the raises. A good substantial back is left over the drifts, and pillars are left at stated intervals. The shrinkage system will be used to mine the ore. It is estimated that not over ten per cent. of the ore will be left in the pillars. Stopping was carried on throughout the year on the fifth level and on the east end of the third and fourth levels, open pit.

On December 9th, Nos. 1, 2 and 3 pillars, holding up the north wall of the open pit, collapsed, carrying with them about forty feet of the brow for a horizontal distance of about 200 feet. It is estimated that 230,000 tons of ore and rock fell into the pit. Outside of breaking the dry wall drifts on the fifth level between No. 1 and 2 shafts, very little damage to the mine was done. The fall curtailed the output for about a month. A new hoist is being installed, and when the ore pocket is completed at the sixth level larger skips will replace the 2½-ton skips now in use. Two compartments of the shaft will be used to hoist ore, and one compartment for hoisting tools, timber and men. Safety man-skips will be put on early in 1914.

#### Crean Hill

Crean Hill mine, situated three miles northwest of Victoria Mines, was operated continuously during the year. The main shaft was sunk to the eighth level, a distance of 117 feet, and the winze was sunk from the eighth to the ninth level, a distance of 112 feet. A drift will be started immediately to a point under the shaft, and the shaft will be raised from the ninth to the eighth level. The ore body was opened up on the eighth level, and a large stope started. There is also work being done at the fifth and sixth levels. On the sixth level, some of the old stopes are being enlarged, while on the fifth level the filling in the old stopes is being worked over. From the eighth level down the new system of mining will be carried out.

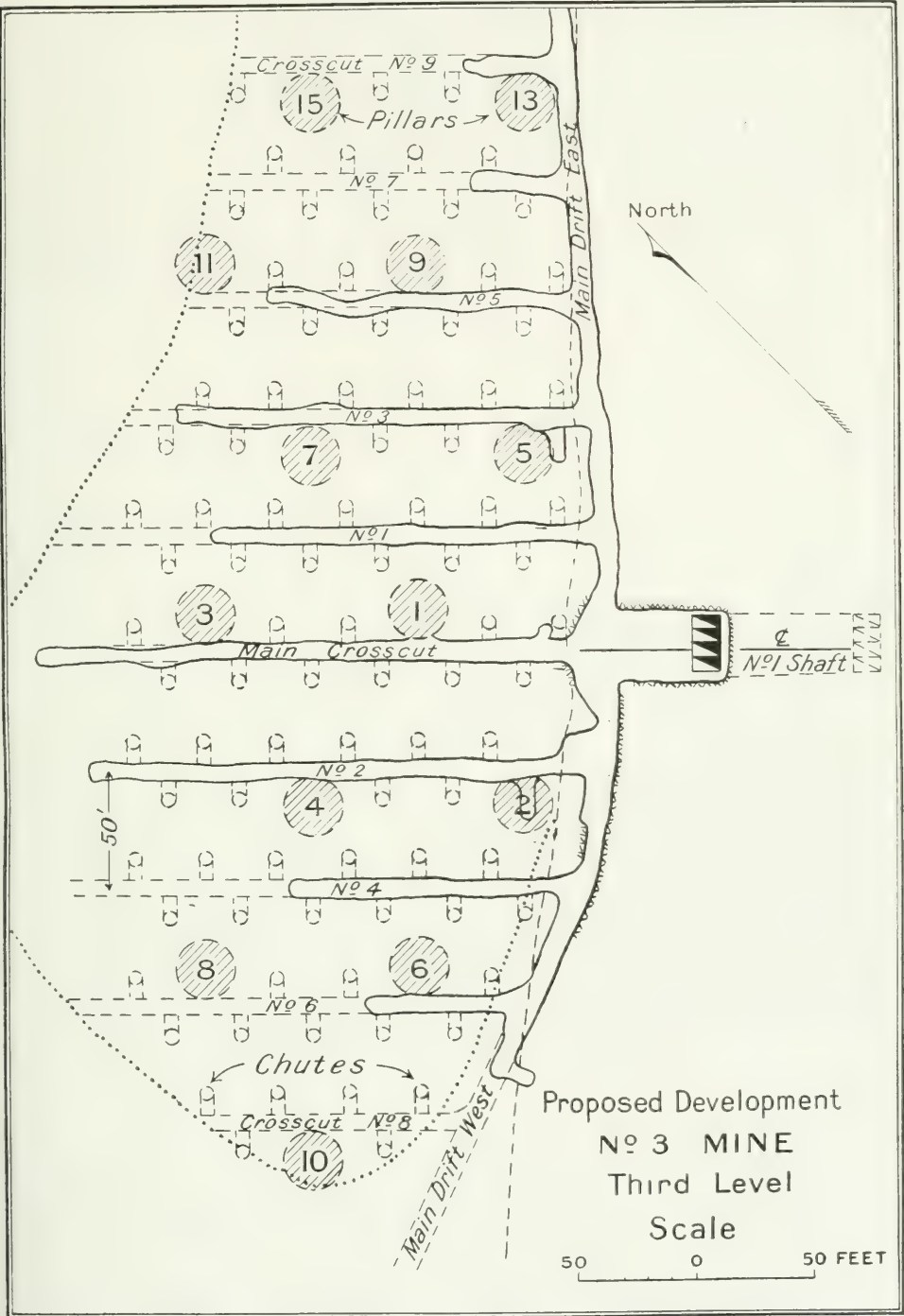
Mr. C. Collins is the local superintendent.

#### No. 2 Mine

The main shaft of No. 2 mine was sunk to the ninth level. This makes the total depth of the shaft 721 feet. Owing to the ore body dipping and getting so far away from the shaft, it was decided to sink a second shaft from the ninth level down. This shaft was started on the incline 175 feet north of No. 1 shaft at the ninth level, and was sunk to the tenth level, a distance of 130 feet. It was also raised to the eighth level. A pocket was cut at the ninth level.

The hoist is on the eighth level. The skips are hoisted above the ninth level, and the ore dumped into the pocket. The ore is trammed from this pocket to No. 1 shaft.

Mr. W. Hamby is the local superintendent.



No. 3 Mine, Sudbury

## No. 3 Mine

Extensive development work was done at No. 3 mine during the year. No. 1 shaft, which is 400 feet deep, had no work done on it, but No. 2 shaft was sunk from the 200-foot to the 300-foot level, and a drift 625 feet long was driven to connect the two shafts at the third level. The new system of mining will be used at this mine as well as at the other mines owned by the company. The system at this particular mine consists of driving a long main drift, a short distance south of the ore body, and taking the general direction of the ore body on the south side. Cross-cuts 50 feet apart are driven north from the main drift at right angles to it. Raises are put up on the cross-cuts about 50 feet apart and are placed alternately on either side of the drift. These raises are breasted out and joined at a height of 15 feet above the floor level, thus merging into a large stope. Pillars 25 feet in diameter are left to support the back, and the ore will be taken out by the shrinkage system.

The development work on the third level is finished and the level is ready for stoping. A pipe line is being laid from Whitson lake, a distance of four miles, to supply water for the mine and the town of Frood Mine, which has a population of about 1,200. The town itself was built by the company within the past year.

A vertical compressor, with a capacity of 5,000 cubic feet per minute, is being installed in the new powerhouse.

Mr. T. McNamara is the local superintendent.



New Hospital of the Canadian Copper Company

## Dill Quartz Quarry

About 300 tons of quartz per day were mined and shipped from the quartz quarry in Dill township. The quartz is mined by open-cut work.

During the summer a large storage bin was built beside the track, and an incline run from the top of the bin to the bottom of the cut. The quartz is loaded into small cars, hoisted up the incline and dumped into the bin. This new method should be much safer than the old one of hoisting the buckets by a derrick. The quartz is loaded into railroad cars at the bin and hauled to Copper Cliff, where it is crushed for use at the furnaces and converters.

Mr. H. Whitehead is local superintendent.



### Hospital

The Canadian Copper Company have erected at Copper Cliff a large hospital, to replace the one destroyed by fire in 1912. The new building, which in design and equipment is not surpassed by any in Canada, was erected at a cost of \$250,000. In form the building is T-shaped, with spacious sunrooms at either end. There are four floors with a total area of 28,000 square feet, exclusive of sub-basement.

Opening off the main corridor are the dispensary, doctors' office, several private wards and two large typhoid wards and a separate private exit for out-patients. The sterilizing room is also located here. To the right of the main entrance is the surgical wing, comprising a number of private wards and bathrooms. The second storey contains doctors' and nurses' apartments, private and semi-private wards.

In the basement are the X-ray and dark rooms, laundry and drying rooms, morgue and post-mortem rooms, and a room containing an electric light bath for the treatment of skin diseases.

Dr. McAuley is medical superintendent, with a staff of five physicians and five nurses.

### Mond Nickel Company

The production of the Mond Nickel Company for the year 1913 came from the Garson, Mond and North Star mines, but mostly from the first named. Development and construction work was carried on at the North Star, Worthington, Frood Extension, Kirkwood and Levack properties. The company's new smelter at Coniston was completed in June, and is now operating at full capacity. Diamond drilling was carried on extensively at Levack, and a large body of high-grade ore was blocked out. Shafts will be begun on this property early in 1914. It is estimated that this is the largest body of ore owned by the Mond Nickel Company.

The officers of the company are:—Mr. C. V. Corliss, manager; Mr. O. Hall, mine superintendent; and Mr. J. E. Robertson, smelter superintendent. There are also local superintendents at each of the properties. They employed an average of about 1,200 men during the year.

### Mond Mine

The main shaft of this mine is now at a depth of 2,027 feet vertically, by far the deepest shaft in the Province. The main operations during the year were confined to the tenth, twelfth, fourteenth and sixteenth levels, developing the eighteenth level and sinking the shaft. The ore encountered on the 1,600 and 1,800 foot levels is as good or better than on the upper levels. Apart from the east and west ore bodies, a new high-grade body was encountered north of the west ore body on the 1,400-foot level. This body has been stoped to a height of 100 feet, and shows high-grade ore in the back. The ore is hoisted on cages and treated in the usual way at the surface.

Mr. Mumford is the local superintendent, employing 165 men.

### Garson Mine

The ore production from this mine during the year came from the first, second, third and fourth levels. The shaft was sunk 170 feet, making a total depth of 870 feet. On account of the ore body being irregular in size and shape, the plans of the workings of the several levels projected to the surface cover a large area and are difficult to describe. Some of the stopes are mined by filling and some by underhand stoping. In future, underhand stoping will be employed whenever the bodies are not too wide to allow of this method.

The cages were taken off during the year and replaced by automatic dumping skips with a capacity of four tons. The skips are equipped with a safety device, and are handled by a double-drum electric Nordberg hoist. This hoist is equipped with automatic devices to prevent overwinding, and to govern the speed of hoisting and lower-

ing. The men are lowered and hoisted in these skips. On the upper levels the ore is trammed to the shaft in 1-ton and  $1\frac{1}{2}$ -ton cars. Three of the 1-ton cars are dumped into the skips or two of the  $1\frac{1}{2}$ -ton cars. An ore pocket was cut between the fourth and fifth levels. All the ore mined on the fourth level is dumped into this pocket. Also nearly all the ore from the second level is carried through an ore pass to the fourth level and dumped into the pocket. The skips are loaded at the fifth level by means of a small loading pocket. This loading pocket, which holds a skip load, is filled from the main pocket. When a pocket is full the load is allowed to run into the skip. This prevents too much ore getting into the skip. The miners' dry house was enlarged and several other buildings built during the year. Mr. A. L. Sharp is local superintendent, employing 320 men.



Frood Extension Mine

Frood Extension Mine

The Frood Extension shaft is situated on the northeast quarter of lot 7 in the sixth concession of McKim township, a short distance from the No. 3 workings of the Canadian Copper Company.

Shaft No. 1 is vertical, with four compartments, size 21 x 7 feet, and has reached a depth of 900 feet.

The first level station has been cut at 400 feet, with a drift to the south 250 feet in length. From this point a raise has been driven connecting with No. 2 shaft. At the 750-foot or second level, a drift to the south has been driven 200 feet.

The shaft is timbered to a depth of 850 feet, the main bulkhead being constructed about 12 feet below the second level. The third level station will be cut at 900 feet, where the main ore body will be first developed. It is the intention of the management to sink this shaft to a depth of 1,100 feet before mining is begun.

Shaft No. 2 is vertical, size 5 by 9 feet, and 208 feet deep. From this point connection is made by a raise from the first level south drift. This raise is inclined at 45 degrees.

The company in March, 1914, began the installation of a new compressor and hoisting plant. It is expected that this plant will be in operation by June 1st, 1914.

The hoist is of Nordberg air-driven type, cylinders 23 by 23 inches by 48. It has two drums 10 feet in diameter, and is so constructed that a third drum may be installed. Its speed is 1,000 feet per minute, using a 1½-inch cable and 5-ton skip.

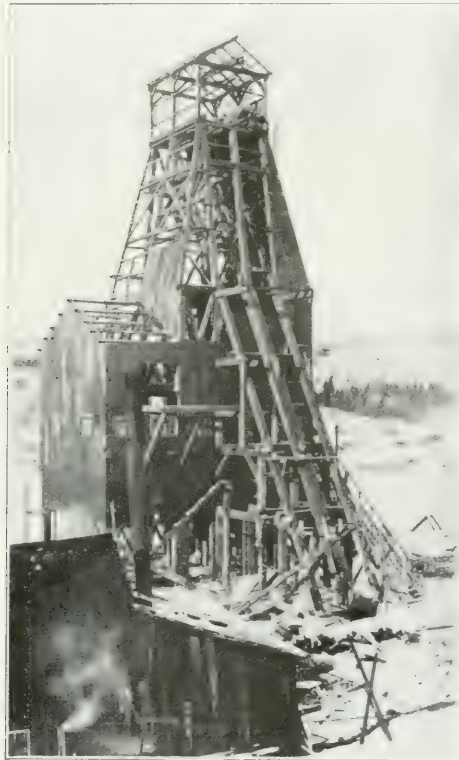
The Nordberg compressor has a capacity of 2,800 cubic feet per minute, and is driven by a Westinghouse synchronous motor direct attached.

There are two receivers, each 30 feet long by 10 feet in diameter, and from these the air passes into a re-heater before being delivered to the hoist. Any surplus air not required to operate the hoist will be used in the mine.

In addition to this air plant there is a Rand compressor of 2,000 cubic feet capacity, belt-driven from an Allis-Chalmers motor. The company have erected several comfortable houses for the miners, and a small village known as Frood Extension has been incorporated.

Plans for a rock house, dry house, magazine and thaw house are now ready, and these buildings will be erected during the summer of 1914.

Mr. J. H. Stovel is superintendent, employing 100 men.



Construction of Headframe at Worthington Mine

#### North Star Mine

The mine, which was reopened during 1912, was operated continuously during 1913. A shaft was timbered through the open pit about 170 feet, and then continued through the solid to a total depth of 300 feet. Stations were cut at 120 and 240 feet, and the levels developed. Several new buildings were erected, including a large power house, in which is installed a Canadian Rand Corliss valve compressor, of 1,700 cubic feet capacity, a double-drum hoist and electric transformers and equipment. All the machinery is operated by electricity.

The greater part of the output in the year was taken from the first and second levels. The shaft is being sunk to the third level. The ore is hoisted in cages in an incline shaft.

Mr. J. H. Smeltzer is the mine superintendent, employing about 145 men.

#### Worthington Mine

The old Worthington mine, situate about twenty-five miles west of Sudbury on the Sault branch, was reopened by the Mond Nickel Company during 1913. A 3-compartment shaft was sunk from the surface to the first level, a distance of 200 feet. This shaft connects with the old shaft and workings of the mine. There was also a small amount of developing work done on the first level and the 80-foot level.

The head frame and rock house were erected at the collar of No. 2 shaft, and are about completed. The rock house and bins are a departure from the type heretofore used in the district. For this reason the operation of the bins will be watched with great interest. If they work well it is likely more of the same kind will be built in future.

A large brick powerhouse was erected during the year, and an 1,800-foot compressor, a double-drum hoist and transformers were installed. Several new cottages of a good substantial type were put up nearer the mine.

Mr. R. M. Palmer is local superintendent, employing 110 men.

#### Kirkwood Mine

This mine, which is about two miles west of the Garson mine, was opened up by the company during the year. The old workings include a pit about 60 feet deep and 30 feet in diameter. This pit is used at the present time for hoisting the ore through, and work has been continued in it. The ore is hoisted in buckets and will be taken by a tramway to the Garson for shipping. A shaft is about to be begun in the bottom of the pit. A 6-inch pipe line supplies compressed air from the Garson.

Mr. Thoenen is local superintendent, employing 54 men.

#### Coniston Smelter

On Lot 3, in the third concession of the township of Neelon, the Mond Nickel Company have erected a new smelting plant. A large acreage has been purchased in this township, and a flourishing village has grown up near the plant. The old smelter at Victoria mines has been dismantled, and the offices removed to Coniston, where an ideal smelter site has been obtained. Situated about eight miles east of Sudbury, on the main lines of the Canadian Pacific railway and Canadian Northern railway, direct connection is afforded to all the company's mines in the district. Ore from the Garson mine is shipped via Canadian Northern, Victoria mine ore via Algoma Eastern and Canadian Northern, and the Canadian Pacific railway gives direct connection with the Frood Extension and Levack properties.

Work on the new plant began in 1911, and the furnaces were blown in on May 12th, 1913.

The plant consists of three modern Allis-Chalmers blast furnaces, size 50 x 240 inches, each having 32 4½-inch tuyeres, through which air is blown at 30-ounce pressure.

The roasted ore is brought in from the roast yards about three-quarters of a mile distant via Canadian Northern, and delivered to the bins in standard gauge ore cars. The furnace charge, which consists of roasted and green ore in equal parts, converter slag, limestone and coke, is delivered to the furnaces in cars of 500-pound capacity, hauled by an electric locomotive.



On the date of inspection, two furnaces were in blast, each smelting 400 tons of ore per 24 hours, which amount may be increased in the future. The furnace matter, containing about 20 per cent. copper and nickel, is tapped into a settler 20 feet in diameter. From the settler it is tapped into a 10-ton ladle, and conveyed by a Whiting foundry 50-ton crane to the converter. There are three Pierce-Smith standard basic converters, each having a capacity of 20 tons per day of Bessemer matte, containing 80 per cent. copper and nickel.

The converter slag is tapped into ladles and returned to the furnaces. The Bessemer matte is poured into moulds, and broken up for shipment in oak casks to the company's refining plant at Clydach, near Swansea, Wales.

The flue dust and a portion of the ore fines are sintered on a Dwight-Lloyd straight line sintering apparatus, and the sulphur reduced to one-half its original percentage. The product from this machine is returned to the blast furnace. The sintering plant is still in the experimental stage.

The main furnace building is 360 by 140 feet, the converters being in the same building, placed directly in front of the blast furnaces.

Air is furnished by two Nordberg blowers, having a total capacity of 17,000 cubic feet of air, and three Connelsville blowers with a capacity of 16,000 cubic feet; one large Connelsville blower is being installed.

Electric power from the Wahnipitae Power Company is used throughout the smelter.

The main furnace stack is 200 feet high and 16 feet inside diameter, and the sintering plant stack is 175 feet high, and eight feet in diameter. Both were built by the Alphonse Custodis Chimney Construction Company.

Mr. C. V. Corliss is manager, and Mr. J. E. Robertson smelter superintendent.

### British America Nickel Company

The British America Nickel Company, successors to the Dominion Nickel Copper Company and Holmes and Wilson, confined their operations to development work at the Whistle, sinking the Murray shaft, and construction work at Nickelton—the town-site for the company's proposed smelter, four miles west of Sudbury. During the summer months several houses were built at Nickelton and a smelter site located, and a large staff of engineers worked all summer on the plans for the smelter, etc., and had the same almost completed. In the fall, all operations were suspended, with the exception of the shaft at the Murray. It is stated that the smelter construction was stopped on account of shortage of material, and also that there was no need of having the smelter completed until there was ore enough developed to supply the same, which will have a capacity of 1,000 tons per day.

The company had several diamond drills at work during the early part of the year on the Murray and Elsie properties. After the large deposit was located on the Murray, the company bought out the Gertrude, Elsie and Victor from the Lake Superior Corporation. They now own 21 properties, and it is estimated that they have a very large tonnage of ore blocked out. It is likely the construction of the smelter will be continued during 1914. Electric power for mines and smelter will be brought in from a large power plant.

The officers of the company are:—F. S. Pearson, president; J. Frater Taylor, vice-president; J. C. McAllister, managing director; J. A. Holmes, manager; E. E. Hibbert, superintendent of mines; R. W. Deacon, metallurgical engineer.

### Murray Mine

A 3-compartment shaft was begun at the Murray Mine in 1913, and is now down 400 feet on an incline of 36 degrees. The first station has been cut and timbered. The shaft is so flat that a stairway was built in it for the men to walk up and down on. It

is the intention of the company to sink the shaft to a total depth of 1,200 feet. The shaft is located east of the ore body and is in the solid rock throughout. It dips at about the same angle as the ore body.

Mr. E. E. Hibbert is superintendent, employing 45 men.

### Long Lake Gold Mine

The Canadian Exploration Company operated their mine and mill at Long lake continuously during 1913. By the addition of a new tube mill and extensive changes in the cyanide department the capacity of the 20-stamp mill will be almost double in 1914. The present capacity is about 120 tons per day.

During the summer months all the ore is broken in the open pit and dropped down to the first and second levels through ore passes. On the first level the ore is trammed



Surface Plant at Long Lake Gold Mine

to the shaft and dumped into an ore pocket which holds about 30 tons. The skips are loaded from the ore pocket, and hoisted to a bin at the collar of the shaft. An aerial tram takes the ore from this pocket to the mill bins, a distance of about 300 feet. The buckets are loaded at the bins and dumped automatically at the mill. In the winter months the ore is mined underground by overhand stoping. At present stoping is being carried on at the first level. Part of the broken ore is dropped directly into the 100-ton pocket on the second level through an ore pass, and part of it is trammed to the shaft at the first level. The open pit is about 100 feet in diameter and 40 feet deep. The shaft is 225 feet deep vertically. All the development work is done on the first and main level. A new vertical direct-driven compressor of the marine type was installed during the year.

Mr. R. W. Brigstöcke is manager, employing 85 men.

### Moose Mountain Iron Mine

The Moose Mountain mine, which is in the town of Sellwood, 33 miles north of Sudbury, on the Canadian Northern Ontario railway, operated continuously during 1913. No. 1 mill, which is used to concentrate the ore from Nos. 1, 5, and 6 ore bodies, ran steadily during the year. The ore from these three deposits is put through a No. 9 gyratory crusher and taken by a belt conveyor to a large bin in the mill. From here it passes through more gyratory crushers, which crush to a 1-inch ring, and is concentrated magnetically. The greater part of the rock is sold as trap rock. The total output of the three ore bodies in the year was 146,000 tons, while No. 1 mill turned out 104,000 tons of finished product.



General View of Moose Mountain Mine

No. 2 mill, which was only in its experimental stages, operated for the first three months in the year, but had to be closed down on account of a shortage of power. This mill takes care of all the dust and fines from No. 1 mill, and the output of the several ore bodies that cannot be concentrated in No. 1 mill. The ore is crushed very fine and concentrated magnetically. The concentrates are briquetted and fused. After the fusion takes place the briquettes are solid enough to stand very rough usage and contain about 63 per cent. iron. This process also removes some phosphorus and gives a Bessemer product.

No. 1 deposit furnishes nearly all the ore for No. 1 mill. The ore is broken in the open pit and dropped to the first level through large ore passes. It is hoisted from there in skips through the 3-compartment shaft. No. 5 deposit furnishes a small amount of ore to No. 1 mill. This deposit is about 1,000 feet south of No. 1. The ore is taken from No. 5 deposit to the crushers by gravity, and the empty skips are hauled back. The shaft was sunk 60 feet during the year.

Mr. F. A. Jordan is manager, employing 238 men.



### Algoma Steel Corporation

The Algoma Steel Corporation operated the Helen and Magpie mines in Michipicoten and the blast furnaces at Sault Ste. Marie, and did extensive diamond drilling at the Helen, Josephine and Morrison properties. The Josephine is one of the old properties which contain hematite. The Morrison is a pyrite property near the Goudreau, and is being developed and tested. The Goudreau was leased to the Madoc Mining Company, who are drilling on it at present, and intend to operate in the near future. Construction work was carried on at the Helen and Magpie mines.

Mr. J. Frater Taylor is president; Mr. W. E. Franz, vice-president; Mr. S. Hale, manager; Mr. A. Hasselbring, superintendent of mines.



Roasting Plant at Magpie Mine in Course of Construction

#### Magpie Iron Mine

At the Algoma Steel Corporation's Magpie mine in the Michipicoten district, experiments in preparing siderite ore for the market have been under way since January 1st, 1913.

The siderite, as it comes from the mine, carries from 33 to 37 per cent. iron, and an objectionable percentage of sulphur. Consequently the treatment in preparing the ore for market must include both calcination and de-sulphurization.

The roasting plant erected for the first attack on this problem consisted of one 125-foot rotary kiln, discharging into two 60-foot rotary kilns. The 60-foot kilns were fired with producer gas, and the 125-foot kiln with the waste gases from the shorter kilns. Powdered coal was also tried instead of gas for firing the kilns. Later, an attempt was successfully made by Mr. Hasselbring to effect both calcination and de-sulphurization in the 125-foot kiln alone, using powdered coal as fuel. The result, so far, has been satisfactory.

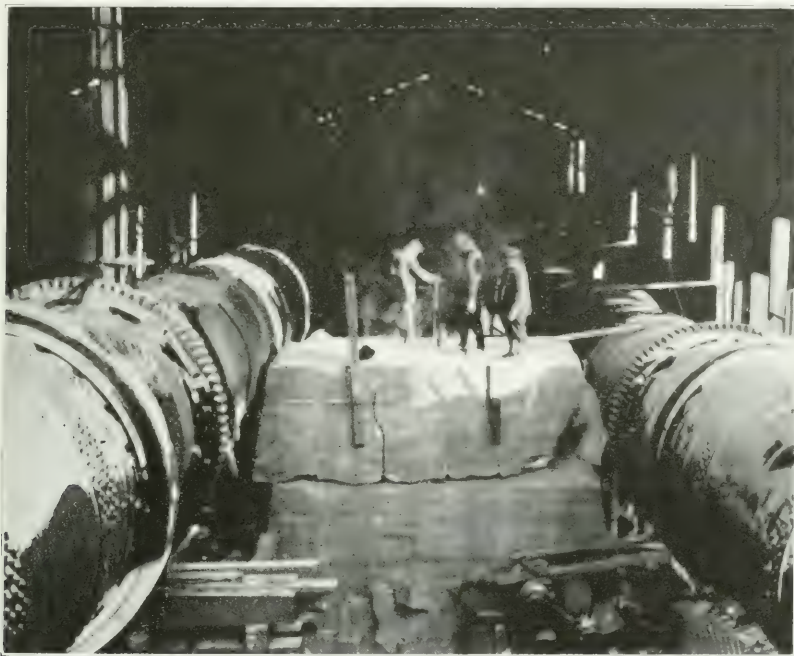


This being the pioneer attempt to make the siderite ore of New Ontario marketable, there are, naturally, many difficulties to contend with. The Algoma Steel Corporation have, however, considered it advisable to erect new roasting units, laid out in such a way as the experience of the past few months suggests, in the hope that the larger tonnage secured from a plant of several units may sufficiently reduce the cost of producing a marketable ore.

The new units will consist of one 125-foot kiln each, fired by powdered coal.

#### Helen Iron Mine

The production of hematite from the Helen iron mine in 1913 was not as great as in 1912. This was due mainly to the fact that the old shaft was moving towards the open pit, between the second level and the surface. For this reason No. 2 shaft had to be extended on an incline of 61 degrees from the fourth level to a point on the surface



View of Tubes, Magpie Roasting Plant

200 feet south of the collar of the old shaft and 150 feet higher. The total distance driven was 481 feet. It may be interesting to know that the last 235 feet of the shaft, which was 6 by 14 feet inside timbers, was raised and timbered with the regular 10 by 10-inch sets placed at 5-foot centres in 22½ days of two ten-hour shifts.

The crusher was moved from the old to the new location at the top of the hill. The hoist was moved 300 feet farther south and 75 feet higher. A belt conveyor, 240 feet long, was installed to carry the crushed ore from the crusher to the ore bin on the side of the hill. The ore is carried by gravity from the belt conveyor to the railroad cars.

Ore was mined on the sixth and seventh levels. On the former the pillars were robbed, but the greater part of the ore was won from the fall above the sixth level under the open pit. This ore comes principally from the pillars that collapsed on the third, fourth and fifth levels in 1911. All the ore from these pillars cannot be saved, because it is badly mixed with pyrite.



General View of New Plant at Helen Mine



Steep Hill Falls Power House, Michipicoten

On the seventh level the ore is mined by the caving system. Three sub-levels are being worked between the sixth and seventh levels. These sub-levels are 15 feet apart, and are carried in a series of steps from the sixth to the seventh level. All the ore is trammed into raises by 1-ton cars, and goes to the eighth level. It is taken from the raises on the eighth level to the shaft in 2-ton cars.

A large deposit of low-grade pyrite, which lies under Boyer lake, will be opened up in the near future. This pyrite occurs in the form of sand. The impurities are very small particles of iron ore intimately disseminated throughout. A concentrating plant will be installed to handle this pyrite.

A. A. MacKay, superintendent, was succeeded by G. R. MacLaren in September. An average force of 80 men was employed.

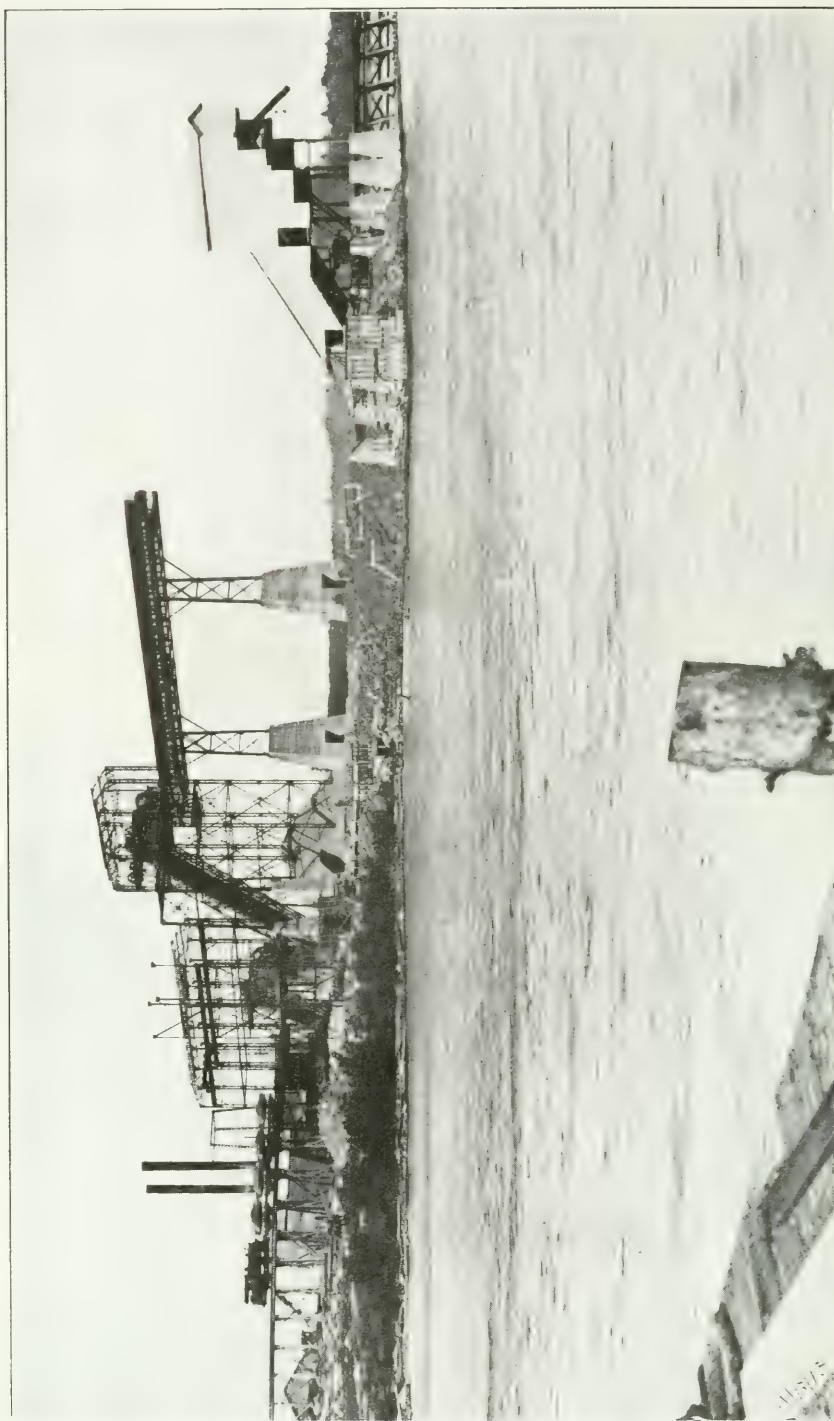
### **International Trap Rock Company**

The trap rock quarry at Bruce Mines was opened up and a large plant installed in 1913.

The rock is taken from the quarry and hauled in 5-ton cars to a 5 by 7-foot jaw crusher, which is said to be the largest crusher in Canada. The rock is discharged from the jaw crusher into No. 9 gyratory crushers, and is fed from there to a series of bucket conveyors. From these it goes to a series of revolving trommels, in which it is sized. The several sizes are taken on belt conveyors to the stock yard. Two concrete tunnels run under the stock yard, and the rock is fed on to a belt conveyor which runs in the tunnels; this takes the ore directly to the boats.

It is estimated that the plant can handle from 400 to 600 tons of material per hour. Mr. Martin is superintendent.

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Crushing and Loading Plant of International Trap Rock Company



## III.—TIMISKAMING

## Cobalt and Vicinity

The production of silver from the Cobalt district was approximately half a million ounces less in 1913 than in 1912, being 29,682,015 ounces, as compared with 30,243,859 ounces during the previous year. This represents about 14 per cent. of the world's total production of silver.

Four new dividend payers appeared during 1913: Seneca-Superior, Casey Cobalt, Cobalt Lake, and Caribou Cobalt, formerly the Drummond mine. The most important features of the year were the satisfactory results obtained during development by the Casey Cobalt mine in Casey township, also by the Seneca-Superior on Cart lake, Coleman township, and the remarkable high-grade veins exposed on the Kerr Lake Mining Company's property by the dewatering of Kerr lake.

Owing to the gradual depletion of the high-grade veins in the Cobalt district, the mining companies are increasing the amount of low-grade ore being treated, resulting in the employment of more men and demand for more power. The Northern Ontario Light and Power Company are developing an additional 4,000 horse-power at Fountain falls on the Montreal river, 10 1-3 miles below Gillies depot. Cobalt camp is now using about 20,000 horse-power.

The Miller Lake-O'Brien mine, Gowganda, is developing about 500 horse-power on the east branch of the Montreal river, between Gowganda and Burke lakes.

The tonnage of ore milled during the year showed an increase of 46 per cent. compared with 1912. An 80-stamp mill was built by the Northern Customs at Mileage 104, one mile north of Cobalt. The Beaver, Cobalt Lake and Casey Cobalt companies doubled their milling capacity during the year, and the McKinley-Darragh-Savage company added twenty stamps to their 30-stamp mill. The Buffalo Mines completed a mill for high-grade ore.

## Concentrating Plants

The concentrating plants and their capacity are shown in the following table:

Mill	Capacity per day, Tons.	No. of Stamps.	Method of Treatment.
Beaver .....	90	Crushing by rolls	Concentration.
Buffalo .....	250	" "	Concentration and cyaniding.
Cobalt Lake.....	150	40	Concentration.
Cobalt Reduction.....	335	120	"
Colonial .....	25	10	"
Coniagas .....	180	60	"
Dominion Reduction .....	175	40	Pan amalgamation, concentration and cyaniding.
Hudson Bay.....	70	20	Concentration.
King Edward .....	30	10	"
McKinley—Darragh-Savage ..	200	50	"
Nipissing .....	240	40	Cyaniding.
Nipissing Reduction .....	70	Crushing by rolls	Concentration.
Northern Customs.....	225	80	"
O'Brien .....	140	30	Concentration and cyaniding.
Penn-Canadian.....	75	Crushing by rolls	Concentration.
Silver Cliff .....	75	" "	"
Temiskaming .....	130	40	"
Trethewey.....	110	30	"
Outlying Camps.			
Casey Cobalt.....	90	30	"
Miller Lake—O'Brien .....	30	10	"
Wettlaufer.....	30	Crushing by rolls	"
Totals.....	2,720	610	

### Labor

There were no labour troubles in Cobalt and vicinity during 1913. The number of men employed was about 500 more than last year. There was a very marked difference in the supply of labour at the beginning of the year compared with the latter months, there being a scarcity of even unskilled labour during the first nine months of 1913. Skilled English-speaking miners can always obtain employment, although during the winter 1913-14 there was a surplus supply of unskilled labour.

Twelve men were killed in Cobalt during the year; ten of these fatalities occurred underground and two on the surface. Two men were killed underground in Gowganda. This is an increase of five over the preceding year.

On January 1st, 1914, the Eight-hour Act came in force in the mines of this district. This Act calls for eight hours work underground—from face to face. The only difficulty which arose from the change in hours was at the Coniagas mine, where the management continued the nine-hour day, allowing and paying the men for one hour going to and from work. A strike resulted, but was shortlived.

### Cobalt Silver Mines

#### Aladdin

The Aladdin Company own and operate the old Silver Queen mine, employing an average of 16 men. Captain Conrad Jorgensen is president, and Mr. J. A. McVichie is manager. Ore amounting to 1,898 tons was milled at the Nipissing Reduction Company's works, which were leased by the Aladdin. This ore produced 57,212 tons of concentrates, of which 31.5 tons were shipped, yielding 19,511.4 fine ounces of silver.

#### Bailey

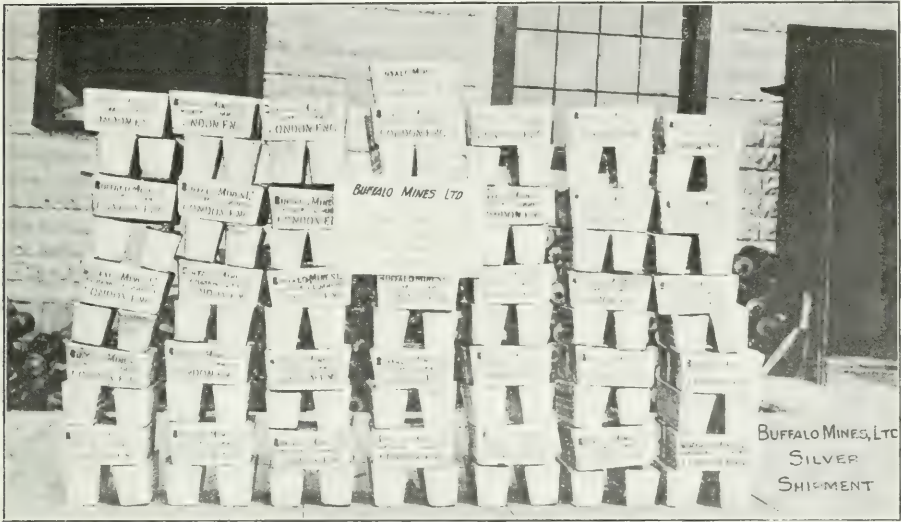
The Bailey Cobalt Mines, Limited, under superintendent Floyd Weed, carried on work during the year on the southwest quarter of the north half of lot 4 in the fourth concession of Coleman, adjoining the Penn-Canadian mine. Mr. G. A. Benson is president and treasurer of the company.

The following table shows the development work during the year:

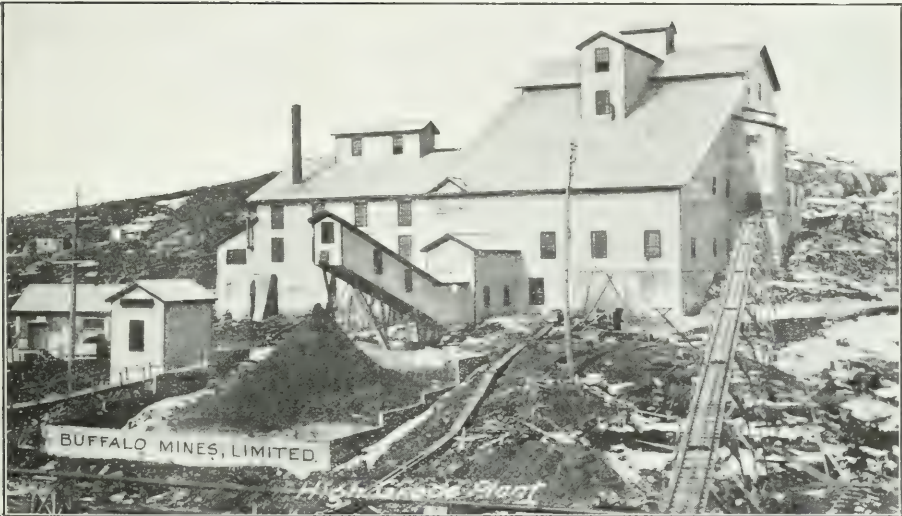
	Drifts.	Cross-cuts.	Raises.	Shafts.
	feet.	feet.	feet.	feet.
1st level .....	111	146	.....	.....
1st sub-level .....	117	47	72	.....
2nd sub-level .....	.....	107	.....	.....
2nd level .....	255	28	16	.....
3rd sub-level .....	92	.....	72	.....
4th level .....	65	14	.....	4
4th sub-level .....	140	24	9	.....
Shaft .....	.....	.....	.....	52
Totals .....	780	366	169	56
Total development .....	1,371 feet			

#### Beaver

The Beaver mine, situated on the north half of the northwest quarter of the north half of lot 1 in the third concession of Coleman, is owned and operated by the Beaver Consolidated Mines, Limited, which have an authorized capital of 2,000,000 shares of a par value of \$1.00 each. The officers are as follows: Frank L. Culver, president and general manager; C. C. James, vice-president; H. E. Tremain, secretary-treasurer.



Shipment of Silver Bullion from Buffalo Mine



New High-Grade Mill at Buffalo Mines, Limited

During the year the capacity of the concentrator was increased by the addition of a larger ball mill to 100 tons per day. A new Nordberg hoist was purchased, capable of lifting 8,000 lb. from a depth of 2,000 feet at a speed of 1,800 feet a minute. As soon as the hoist is installed the shaft will be continued to the 900-foot level.

Underground work during the year was as follows:

Drifting . . . . .	3,222.5 feet
Cross-cutting . . . . .	916 feet
Sinking . . . . .	96.5 feet
Raising . . . . .	287.5 feet
<hr/>	
Total . . . . .	4,522.5 feet
Stoping—4,685 sq. yards.	
Station cut at the 800-foot level.	

The main shaft is now down 820 feet. On the 460-foot level two veins of high-grade ore were cut in the granite formation.

During the year the mill operated 293½ days and treated 25,256 tons of ore. The heads averaged 18.6 oz. silver and the tails 3.65 oz.

One dividend of \$60,000 was paid during the year.

This company during the past two years have been paying particular attention to safety, both above and below ground, and have a thorough system of inspection. During the year only one accident occurred, and that a minor one.

#### Buffalo

This mine, situated on the townsite of Cobalt, is owned and operated by the Buffalo Mines, Limited, which have an authorized capital of \$1,000,000, the shares having a par value of \$1.00.

The officers of the company are as follows: Mr. Chas. L. Denison, president; Mr. Robt. W. Pomeroy, vice-president; Mr. Geo. C. Miller, secretary-treasurer; Mr. Tom R. Jones, general superintendent; Mr. E. W. Jones, assistant superintendent.

The development work during the year was as follows: Drifting, 1,979 feet; raising, 92 feet; stoping, 62,844 square feet. Operations underground were practically on the same plan as in former years.

The low-grade mill treated 71,042 tons; the cyanide plant, 11,744 tons; the high-grade mill, 1,116 tons of high-grade ore and concentrates. From the high-grade ore and concentrates treated at the high-grade plant, 1,668,763 fine ounces of bullion were recovered and shipped. A shipment was also made of 57 tons of concentrates, which returned 83,436 fine ounces of bullion, giving a total of 1,752,199 fine ounces of silver bullion shipped during the year.

#### Casey Cobalt

This property, situated on the southeast quarter of the south half of lot 5 in the first concession of Casey township, about 10 miles northeast of the town of New Liskeard, is controlled by the Casey Cobalt Mining Company, Limited, with an authorized capital of \$100,000. The company was an important producer during 1913.

A 30-stamp mill is in operation. A power line has been built from New Liskeard and the plant is now electrically driven.

Mr. N. R. P. Parker is president; Mr. John Shaw, manager.

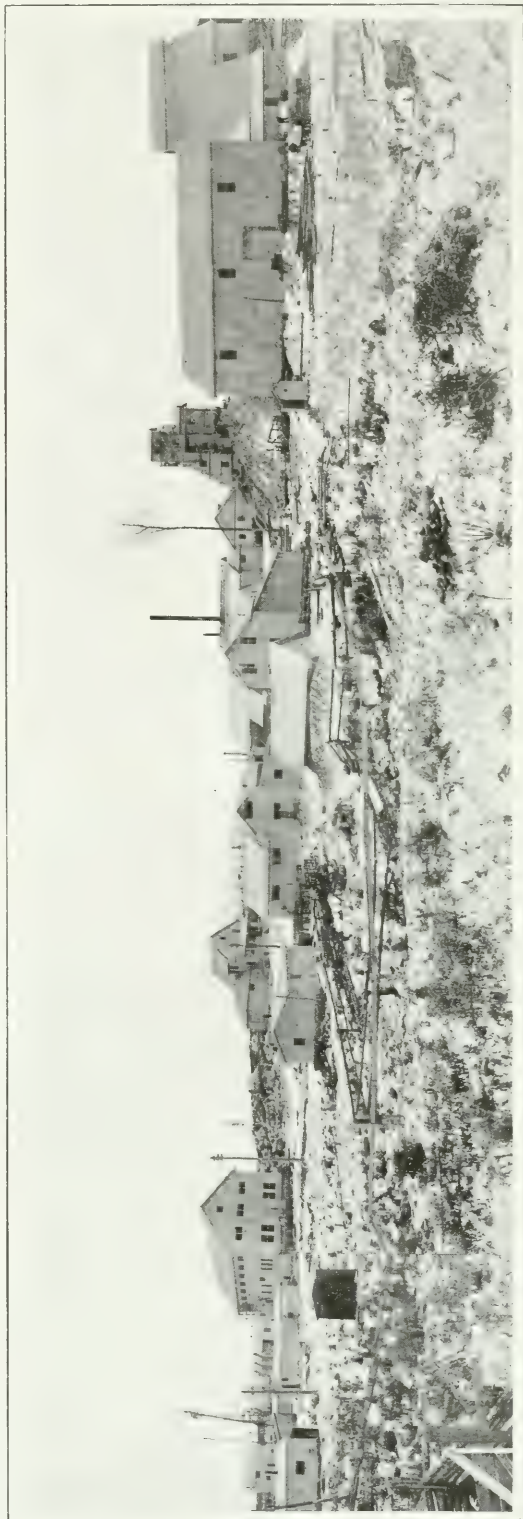
#### Chambers-Ferland

The Chambers-Ferland Mining Company, Limited, continued operations in the old No. 1 and No. 2 shafts, adjoining the La Rose and O'Brien, but the chief development during the year was the sinking of No. 4 shaft to a depth of 304 feet, on their territory west of the railway. The officers of the company are as follows: Captain C. Jorgensen, president; Mr. Arthur Ferland, vice-president; Mr. Alex. Fasken, secretary-treasurer; Mr. J. A. McVichie, manager.





Surface Plant, Casey Cobalt Mine



Surface Plant, Porcupine Crown Mine

At the Nipissing Reduction Company's works 8,886 tons of ore were milled, yielding 57,898 tons of concentrates, containing 50,401 fine oz. of silver. In addition, 172,264 tons of ore, containing 19,066.27 fine oz. of silver, were shipped to smelters.

Following is a summary of the development work done during the year:

Sinking . . . . .	359 feet
Raising . . . . .	168 feet
Drifting and cross-cutting . . . . .	790 feet
Stoping (all in No. 1 mine) . . . . .	2,595 tons

#### City of Cobalt

The control of the City of Cobalt Mining Company was purchased early in the year by interests allied with the Cobalt Townsite Mining Company.

The new officers are as follows: J. P. Watson, president; W. R. P. Parker, vice-president; C. E. Watson, manager.

The development during the first five months of the year consisted of about 1,000 feet of drifting and cross-cutting, about 100 feet of raising, and the deepening of the shaft from 330 to 400 feet. The development under the new management, from June 7th to December 31st, 1913, comprised: drifting, 548 feet; cross-cutting, 830 feet; raises, 196 feet.

A new 9 by 12 single drum hoist was installed.

#### Cobalt Comet Mine

During the year the Drummond mine was sold to the Cobalt Comet Mines, Limited, the new owners taking possession on March 31st. It is now known as the Cobalt Comet mine. The portion of the property underlying Kerr lake was subsequently sold to the Kerr Lake and Crown Reserve companies, who are operating it under the name of Drummond Fraction. The area of the fraction is about seven acres and the area of the Cobalt Comet about 71 acres. The Cobalt Comet is controlled by the Caribou-Cobalt Mines Company.

The property is operated through two shafts, No. 1 and No. 5, which are 140 feet and 200 feet deep respectively. No. 5 shaft is equipped with an electric hoist and cage, and No. 1 with a steam hoist and skip. The shafts are connected by drifts underground. There is a total of 8,915 feet of development.

The low-grade ores are shipped over the aerial tramway to the Dominion Reduction Company's mill and by rail to the Northern Customs Concentrators. The high-grade ore is sold to the Nipissing high-grade mill. The total output for the year was about 15,500 tons.

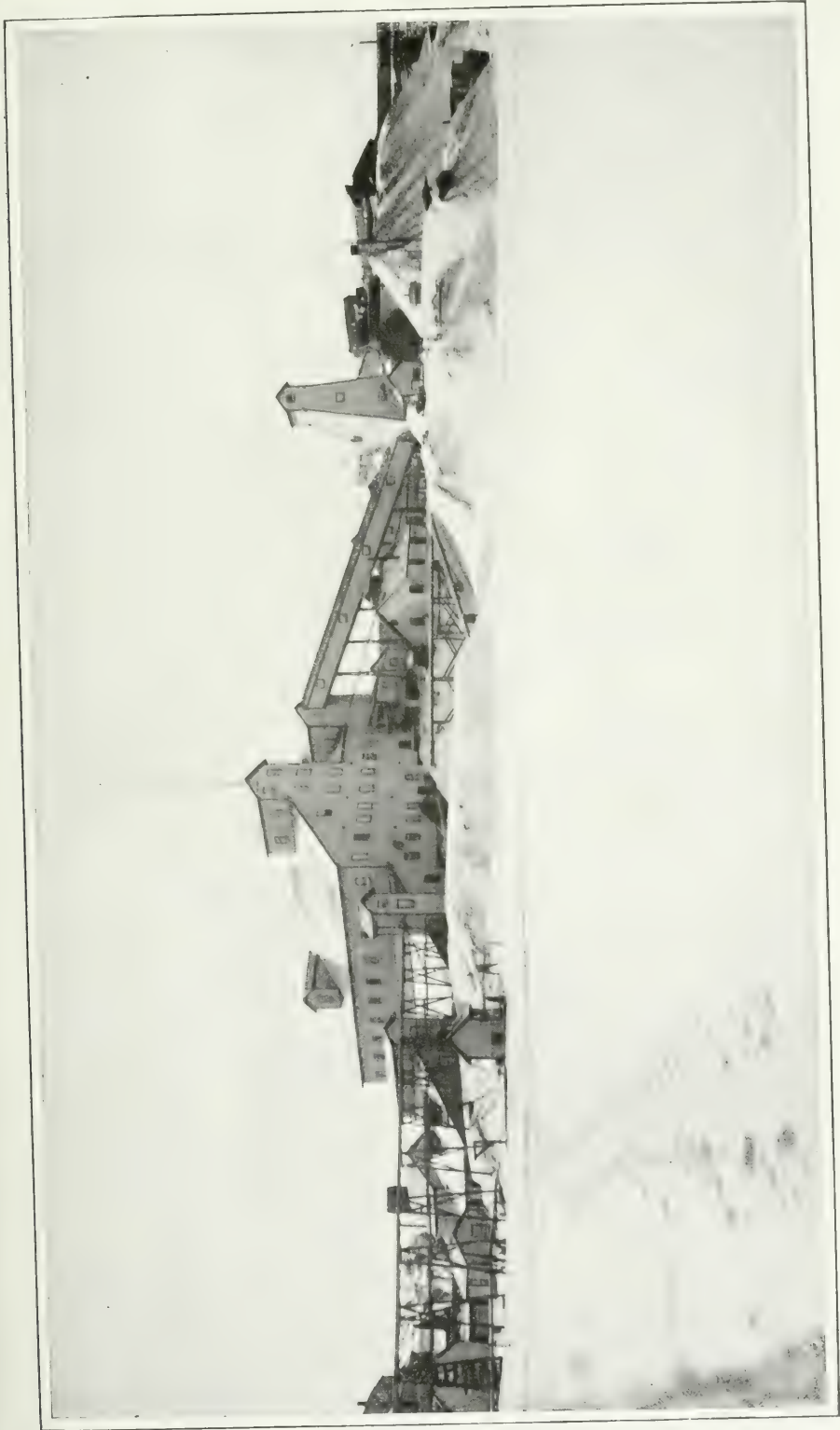
Mr. E. V. Neelands is manager of the company and 60 to 70 men are employed.

#### Cobalt Lake

Cobalt Lake Mining Company, Limited, own and operate the bed and margin of Cobalt lake. The officers of the company are as follows: Sir Henry Pellatt, president; Major J. A. Murray, vice-president; Messrs. W. R. P. Parker, Hugh Blain, J. F. Watson, directors; G. F. Morrison, secretary-treasurer; M. B. R. Gordon, manager.

The manager reports the following underground work during the year: Drifting, 1,570 feet; cross-cutting, 1,442 feet; raises, 285 feet; winzes, 98 feet; shafts, 14 feet; stoping, 423,449 cu. feet.

The exploratory work opened up two new enriched areas, viz.: vein No. 1, and vein system No. 2. Vein No. 1 was encountered by a cross-cut driven west along the McKinley-Darragh-Savage boundary line, and has been drifted on at the 225-foot level for a distance of 320 feet to the Townsite Extension boundary. At this level it was entirely in the Keewatin, the conglomerate lying from 15 to 20 feet above. Four raises were driven from this level, and each one encountered good ore on reaching the conglomerate. The opening up of vein system No. 2 has been the greatest success during



40-Stamp Mill of the Cobalt Lake Mining Company, Limited



the year. A total of 600 feet of drifting has been done on these veins. Vein No. 1 runs parallel to a fault along which the rock is much fractured, permitting extensive seepage from the lake above. Very little stoping is being done here until after the lake is drained.

On December 23rd, 1913, Mr. T. E. Godson, Mining Commissioner, made an award, granting the company permission to drain the lake. This work will probably be carried out during the coming year.

During the year the size of the mill was doubled by the addition of twenty stamps, at a cost of \$45,000.00, and the new stamps were put in operation towards the end of May.

The mill treated during 1913 a total of 37,616 tons of ore, with an average silver content of 25.4 ozs. per ton. From this tonnage, 1,000.4 tons of concentrates were produced, containing a total of 803,543 ozs. of silver. The mill was run 309 days, at a net cost for operation and maintenance of \$54,764.20.

The total output of the mine for the year was 973,676 oz. of silver.

#### Cobalt Townsite

The Cobalt Townsite Mining Company, Limited, with an authorized capital of \$100,000, hold a 99-year lease from the Temiskaming and Northern Ontario Railway Commission of the south 38 acres of the townsite of Cobalt.

Mr. W. R. P. Parker, of Toronto, is president; J. P. Watson, vice-president; R. Simpson, secretary-treasurer; C. E. Watson, manager.

The development during the year consisted of 2,183 feet of drifting; 3,559 feet of cross-cutting; 603 feet of raising and 162 feet of sinking.

The Northern Customs Concentrators, which previously treated the company's ore under contract, was purchased and taken over on November 1st.

#### Colonial

The Colonial Silver Mines, Limited, operated the mine and mill during January and February, 1913. The mill was leased to the Right of Way Mining Company, and that company's ore was treated there during the last seven months of the year.

A small amount of work was done on the 350-foot level of the mine during the last quarter of the year.

#### Coniagas

The Coniagas Mines, Limited, having an authorized capital of 800,000 shares of a par value of \$5.00, own and operate the Coniagas mine, consisting of 40 acres on the townsite of Cobalt, and the issued capital stock of the Coniagas Reduction Company, Limited. The Board of Directors is as follows: R. W. Leonard, St. Catharines, president and general manager; Alex. Longwell, Toronto, vice-president; R. P. Rogers, Cobalt; F. J. Bishop, Brantford; Welland D. Woodruff, St. Catharines.

During the year \$1,640,000 was paid in dividends.

The assistant to the president reports that during the year the following underground work was done:

Drifting . . . . .	2,160 feet
Cross-cutting . . . . .	1,655 feet
Winzes . . . . .	77 feet
Raises . . . . .	104 feet
Stoping . . . . .	47,370 tons

The mill ran 98 per cent. of possible time, treating 54,890 tons, or an average of 2.95 tons per stamp per 24 hours. The mill heads averaged 28.3 oz. per ton; the average of the general tails was 4.23 oz.

During the year lot No. 290, of which the company own the mining rights, was purchased, and six acres adjoining the westerly boundary of the property were leased, in order to secure suitable sites for employees' houses.



## Crown Reserve

The Crown Reserve Mining Company, Limited, with an authorized capital of 2,000,000 shares, par value of \$1.00 each, own and operate the Crown Reserve mine at Cobalt, work the Silver Leaf mine under lease, own and hold 60 per cent. of the entire capital stock of the Porcupine Crown mine, Porcupine, and, in conjunction with the Kerr Lake Mining Company, own the water lots on Kerr lake formerly owned by the Drummond, along with a strip of land 33 feet wide around this end of the lake above the high water mark.

The officers of the company are:—Lieut.-Col. John Carson, president; Mr. W. J. Gear, first vice-president; Mr. C. E. Potter, second vice-president; Mr. James Cooper, secretary and treasurer; Mr. John Reid, assistant secretary-treasurer; Mr. S. W. Cohen, general manager.

The underground work during 1913 is shown in the following table:

	Up to 1913.	1913.	Total.
Sinking and raising .....	2,222 ft.	288 ft.	2,510 ft.
Drifting . . . . .	7,220 ft.	2,558 ft.	9,778 ft.
Cross Cutting .....	7,356 ft.	2,499 ft.	9,855 ft.
Total . . . . .	16,798 ft.	5,345 ft.	22,143 ft.
Stoping in cubic feet.....1913.....			394,489
Stoping in square feet.....do. ....			63,224
Tonnage broken.....do. ....			56,982 tons.

During the year 29,543 tons of ore were milled by the Dominion Reduction Company for this company from which 525,312 ounces of silver were recovered; 1,253,296 ounces of silver were produced in high-grade ore. The total production to January 1st, 1914, was over 17,000,000 ounces, and over five and one-half million dollars have been paid in dividends.

Regarding the draining of Kerr lake, the annual report of the Crown Reserve Mining Company for 1913 gives the following information:

Permission having been granted on May 1st, 1913, by the Mining Commissioner of Ontario to the Crown-Reserve Mining Company, Limited, and Kerr Lake Mining Company, Limited, jointly, to pump out the water and mud from the bed of Kerr lake, construction work was immediately begun. The method of procedure follows:—

A 100-ton barge was constructed on which were installed four single-stage pumps, each with a capacity of 1,800 gallons of water per minute, arranged in two units, each unit being directly connected to a 250 H.P. motor; the pumps having a 12-inch suction and a 10-inch discharge. At the beginning, as long as fresh water was being pumped and the head was not excessive, the pumps were operated in parallel, that is, each pump discharged independently into the main discharge line. Later, against the greater head, and when the pumps were working on mud, the pumps were operated in series, that is, there was one suction for each unit, the water going from the first pump into the second pump, and then into the discharge line. The whole installation is very elastic, and adapted to any changes made necessary by new conditions. The barge was first anchored near the shore of the lake, and as the water was lowered, it was floated out to the middle of the lake, the connection between the shore and the barge being made by two universal ball and socket joints, and an expansion and contraction joint supported on floats.

A 20-inch pipe line was installed from the shore of Kerr lake for a distance of 2,500 feet, where it discharged directly into Giroux lake, from whence it empties into the Montreal river.

Pumping was actively begun on August 28th, and four weeks thereafter most of the clear water had been pumped out, leaving the silt and mud still to be handled, and lowering the lake 28 feet. From that time until the freeze-up of November 28th, good

progress was made in pumping the mud, although the rate of pumping was much less than the handling the water. It was found that there was an average of 25 feet of mud and silt over the whole lake after the clear water had been removed. In all, 325,000,000 gallons of water and mud were pumped out, the lake being lowered a total depth of 38 feet. The operation of pumping the mud will be renewed as early as possible in the spring, and during the next summer, all of the mud should be removed. It may be necessary in connection with this work to put in some kind of a sluicing plant to wash all of the mud into the sump in the middle of the lake, but the cost of such a plant will be nominal.

The total cost of plant installation, including a fresh water plant on Giroux lake, capable of handling 1,000 gallons per minute, was

For the distribution of fresh water .....	\$39,604.76
The total operating cost to date is .....	12,078.29
<hr/>	
The total expenditure to date is .....	\$51,683.05

#### Drummond Fraction

The piece of ground, about six acres in extent, comprising the extreme easterly portion of Kerr lake, previously owned by the Drummond mine, together with a strip 33 feet wide around that portion of the shore of the lake, and carrying with it all mining, surface and water rights, was purchased jointly by the Kerr Lake Mining Company, Limited, and the Crown Reserve Mining Company, Limited, during 1913, and is now being operated by the joint owners.

After the lake was lowered, a high-grade vein averaging two inches in width, together with four or five feet of good milling ore, was opened up on the surface for a length of 60 feet. Arrangements were made with the Cobalt Comet Company, the present owners of the Drummond property, for the rental of the Wright shaft, and a cross-cut was driven from this shaft at the 100-foot level to the vein below. A shaft house, ore house and other necessary buildings were constructed, and the property is now producing milling ore.

Mr. Mark Little is in charge.

#### Gould

Mr. J. G. Sipprell, manager of the Gould Consolidated Mines, gives the following account of their development:

The cross-cut was driven out from No. 1 shaft a distance of 214 feet S. 35 degrees E., parallel to the boundary line of the Gould and Seneca-Superior. Nothing of importance was cut, consequently at 200 feet from the shaft in this cross-cut a drift was started in the trend of the vein toward this boundary. After extending this a distance of 278 feet high-grade ore was cut near the boundary. This vein proved to be an extension of the Seneca-Superior vein, and was from one and three-quarters to two inches wide at this point.

All the recent work has been done in the conglomerate at the 200-foot level. No. 1 shaft, down to a depth of 167 feet, is in the conglomerate. At this point the slates dipping at 15 degrees to the northeast are encountered, and continue in the cross-cut on the 200-foot level a distance of 153 feet, when the face has gradually come into conglomerate, which remains through the rest of the workings.

A 10-ton shipment was made in December.

#### Hargrave

The Hargrave Silver Mines have an authorized capital of \$2,500,000. The officers of the company are:—Mr. W. N. Ferguson, president; Mr. R. J. Tough, vice-president; Mr. R. D. Moorhead, secretary-treasurer; Mr. E. V. Neelands, manager.

The development during the year was as follows:—

Drifting . . . . .	505 feet.
Cross-cutting . . . . .	244 "
Raising . . . . .	350 "
Sinking . . . . .	30 "

In view of the unsuccessful results attending the year's developments, it was decided by the directors to suspend operations, and all work ceased December 31st.

#### Hudson Bay

This property consists of 340 acres, situated in the township of Coleman, and is operated by the Hudson Bay Mines, Limited, whose capitalization is 3,500,000 shares of a par value of \$1.00 each. Of this amount, 2,900,000 shares are owned by the Temiskaming and Hudson Bay Mining Company, Limited, which have an authorized capital of \$25,000, of which 7,761 shares have been issued. The latter company paid \$192,003 in dividends during their fiscal year, 1912-13.

The officers and directors of the company are as follows:—Mr. Geo. Taylor, president; Mr. A. A. McKelvie, vice-president; Messrs. S. S. Ritchie, Jr., T. McCamus, J. J. Grills, C. L. Sherrill, D. M. Ferguson, directors; F. L. Hutchinson, secretary-treasurer; A. H. Brown, general manager.

The development during the year was as follows:—

Drifting . . . . .	173.8 feet.
Cross-cutting . . . . .	269.8 "
Adit from surface . . . . .	35.2 "
Raising . . . . .	41.1 "
Sinking winze . . . . .	121.4 "

The mill treated 22,285.6 tons carrying 466,698.8 ounces of silver. The ratio of concentration was 35 to 1. The total silver production was 659,972.19 ounces. A small sum was realized for the copper content of the concentrates.

A fire in July destroyed part of the surface equipment, but caused little delay in mining operations.

At camp No. 2, south of McKinley-Darragh mines and east of the Temiskaming and Northern Ontario railway, 851 feet of drifting was done in exploring the Cobalt lake fault. A new head-frame, blacksmith shop and hoist were installed at the head of No. 2 shaft on this property.

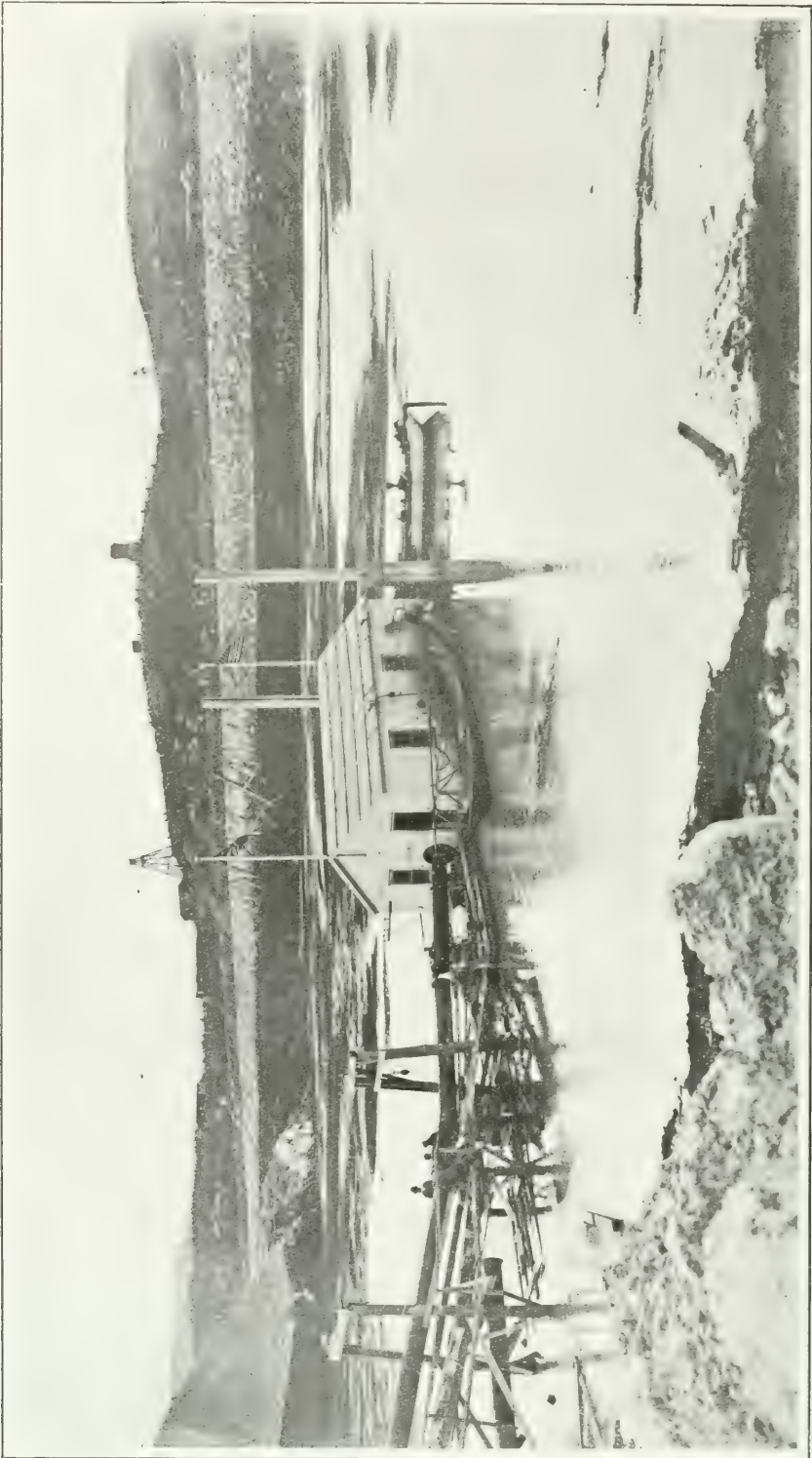
At the Gowganda property of this company the development for the year was as follows:—

Sinking on No. 1 shaft . . . . .	94.0 feet.
Drifting in No. 1 shaft . . . . .	128.0 "
Sinking No. 3 shaft . . . . .	78.0 "
Drifting on 1st level . . . . .	88.0 "
Drifting on 2nd level . . . . .	169.0 "
Cross-cutting on 2nd level . . . . .	220.0 "

Development work not being encouraging, this mine was closed down in July. Surface work was done on the company's claims in Lebel and Teck townships.

#### Kerr Lake

This mine is situated on the northwest part of lot 4, in the fourth concession of Coleman, and it is operated by the Kerr Lake Mining Company, Limited, which have an authorized capital of \$40,000. The capital stock of the company is held by the Kerr Lake Mining Company, of New York, with an authorized capital of 600,000 shares of a par value of \$5.00 each.



Pumping Out Kerr Lake

—Photo by Arthur A. Cole.



The officers of the company are as follows:—Mr. William C. Nickerson, president; Mr. William P. Ward, vice-president; Mr. E. H. Westlake, secretary-treasurer; Mr. Robert Livermore, manager.

The underground development during the year closing September 1st, 1913, was as follows:—

Drifting . . . . .	2,974.0 feet.
Raising . . . . .	160.5 "
Sinking . . . . .	186.0 "
Cross-cutting . . . . .	1,663.5 "
<hr/>	
Total . . . . .	4,984.0 feet.
Stoping . . . . .	38,716.0 sq. feet.

The total development to date is 34,663 feet.

The manager states that the most important development of the year was on the Flemming vein on the 225-foot level. At this level the vein is in Keewatin formation; and here a good amount of second-grade ore and mill rock was opened up with occasional shoots of very high-grade ore.

In consequence of the growing importance of ore of milling grade it has been found necessary to carry the stopes much wider than formerly, and the square-set method of timbering has been adopted.

Eighteen thousand two hundred and fifty-two tons of ore, averaging 29.29 ounces in silver, were treated at the mill of the Dominion Reduction Company. In addition to this, 183,682 ounces of silver were recovered in the company's ore-sorting plant. Altogether 2,109,975 ounces of silver were produced, and \$600,000 paid in dividends during the year. The dividends to date amount to \$4,620,000.

As mentioned before in this report, this company, in conjunction with the Crown Reserve Mining Company, drained Kerr lake, and purchased lots J.B. 9 and 10, together with 33 feet on the shore from the Drummond mine. The draining of Kerr lake exposed a remarkable vein of high-grade ore on the Kerr Lake Mining Company's property.

#### La Rose Consolidated

La Rose Consolidated Mines Company, Limited, operate the following mines:—La Rose, Lawson, Princess, Violet, University and Fisher-Eplett. Mr. D. Lorne McGibbon is president and Mr. R. B. Watson manager.

The production during 1913 was 2,636,000 ounces of silver. The average cost of production was 22.8 cents per ounce, leaving a profit of 36.52 cents per ounce on the shipments. The cost of production was 3.13 cents per ounce less than in 1912, and the price received for silver 2.34 cents less.

The net profit was \$955,418.27, or 61.38 per cent. of the gross value of the ore. The dividends declared for the period amount to \$931,000.

The production of the several properties was as follows:—

	Dry tons.	Oz. silver.	Net value.
La Rose . . . . .	1,313.1235	578,933.31	\$295,991.16
Lawson . . . . .	366.0075	708,936.59	395,624.66
Princess . . . . .	685.4945	909,608.23	499,935.95
Concentrates . . . . .	958.9430	436,538.02	218,082.77
<hr/>			
Total . . . . .	3,323.5685	2,634,016.15	\$1,409,634.54

Following are details of concentration:—

Ore milled .....	37,555.959 dry tons.
Silver contents heads .....	508,288.26 oz.
Average assay heads .....	13.53 oz. per ton.
Concentrates produced .....	950.142 tons.
Silver contents concentrates .....	437,439.41 oz.
Average assay concentrates .....	460 oz. per ton.
Net value of concentrates .....	\$217,924.17.
Cost of concentration .....	\$102,447.54.
Cost per ton, ore milled .....	\$2.73.
Profit to La Rose Mines, Limited .....	\$115,476.63.
Average tonnage for 313 days .....	120 tons per day.
Ratio of concentration .....	39.521.

The above ore was milled at the old plant of the Northern Customs Concentrators. All ore for the current year will be treated at their new plant.

The tons of mill rock supplied by each mine were:—

La Rose .....	15,388 tons.
Lawson .....	4,818 “
Princess .....	17,350 “

Total ..... 37,556 tons.

The annual report of the manager gives the following summary of development at the several mines:—

La Rose mine.—Considerable exploration was done in the bottom of the mine. A cross-cut at a depth of 500 feet below the collar of the main shaft was run to the fault, and 130 feet of drifting was done. This work developed a large calcite vein along the fault which, however, carried only a small amount of silver. An incline shaft was then sunk on the fault for a distance of 233 feet below the 500-ft. level. Near the bottom, at a depth of 215 feet, drifts were run both ways for a combined distance of 80 feet.

The exploration on this large calcite vein in the fault did not produce any pay ore, so work on and below the 500-ft. level was discontinued. Exploration is now centred on the 380-ft. level, which is in the conglomerate just above the Keewatin contact; cross-cuts are being driven in three directions on this level.

Lawson mine.—The chief work at the Lawson has been in stoping on the ore shoots already known.

No. 8 shaft has been sunk to the 400-ft. level, and the main vein is to be explored at this depth.

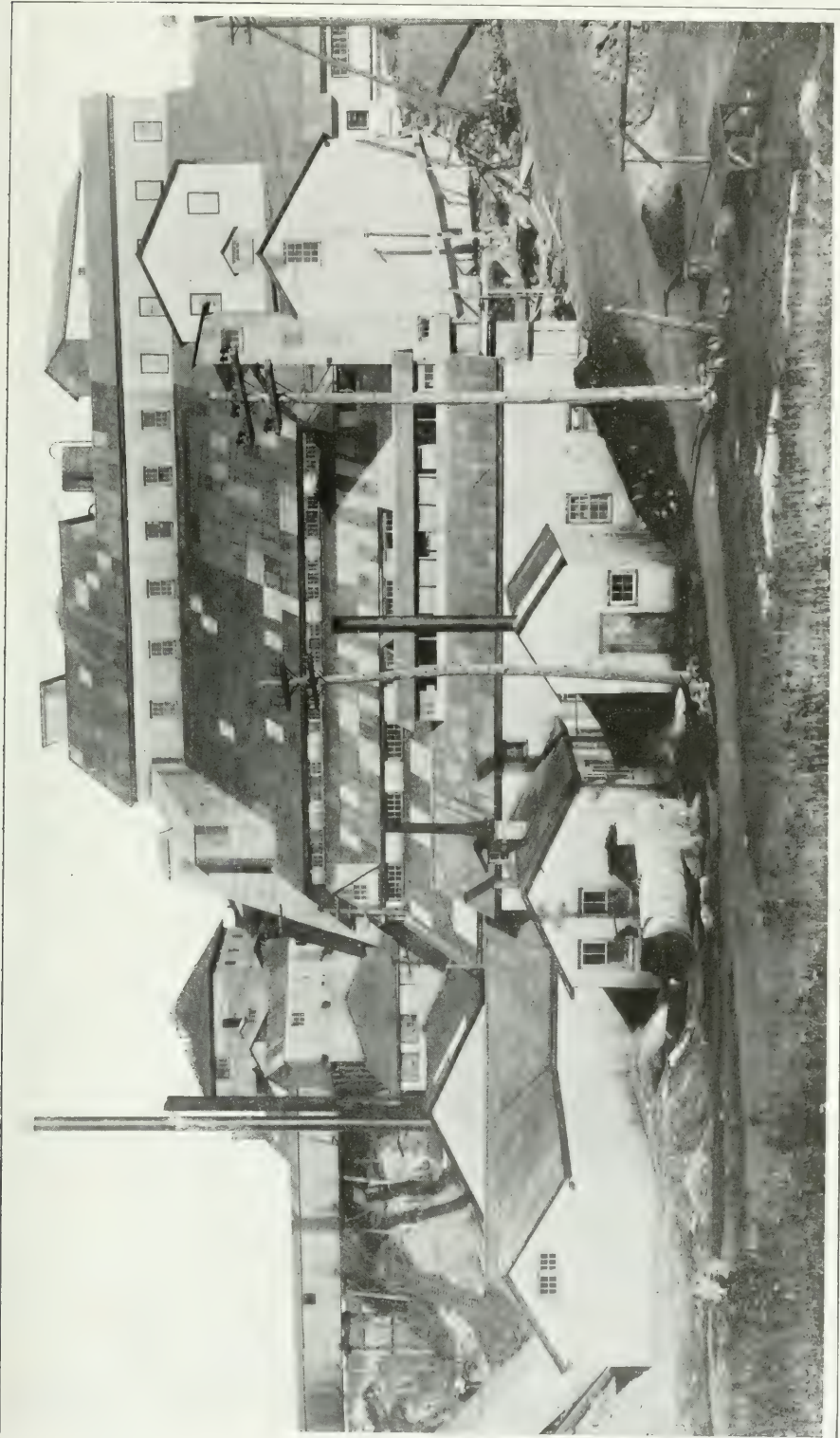
Princess mine.—More development work was done on this claim than on any of the others, and resulted in the finding of four veins.

A winze was sunk on No. 7 vein from the third, or 185-ft. level, down to the Keewatin contact, and the fourth level was driven at a depth of 225 feet. Some drifting was done on the Cobalt lake fault on the third level, but no more favorable results were obtained here than at the La Rose.

The Princess claim contains but seventeen acres, and has been well prospected above the contact.

Fisher-Eplett.—Work was carried on actively at this property throughout the year. The shaft was sunk to the 300-ft. level, where 696 feet of drifts and 561 feet of cross-cuts were driven, without finding any ore of commercial value.

A large flow of water somewhat delayed operations, but the situation is improving, and work will be continued to prospect the remaining territory.



50-Stamp Mill at the McKinley-Darragh Mine

Other properties.—Some cross-cutting was done on the Violet without success. No work was done during the year on the La Rose Extension or on the University. It is the intention to explore the latter claim from the Lawson workings.

#### Lumsden

The Lumsden Mining Company were operating the property situated on the west half of the northeast quarter of the north half of lot 2 in the third concession of Coleman. The main shaft is 400 feet deep, and the work was carried on mainly on the 225- and 250-ft. levels.

The president of the company is Mr. John Lumsden, Ottawa; the general superintendent, Mr. F. I. Daniels, Cobalt.

The following table shows the development during the year:—

Level.	Drifting	Cross-cutting	Sinking Winzes	Raising	Total	Stopes
feet	feet	feet	feet	feet	feet	cu. ft.
225	479	.....	.....	64	543	12,960
250	70	30	.....	.....	100	.....
300	10	32	29	.....	71	.....
Totals....	559	62	29	64	714	12,960

#### McKinley-Darragh-Savage

The McKinley-Darragh-Savage Mines of Cobalt, Limited, own and operate the McKinley-Darragh mine at the southern end of Cobalt lake and the Savage mine on lot 3 in the third concession of Coleman east of Cart lake.

The board of directors consists of:—Mr. C. A. Masten, president, Toronto; Mr. Thos. W. Finucane, vice-president, Rochester, N.Y.; Mr. J. R. L. Starr, secretary, Toronto; Mr. Harper Sibley, treasurer, Mr. Joseph S. Hunn, assistant treasurer, Mr. Hiram W. Sibley, and Mr. W. L. Thompson, Rochester.

Mr. T. R. Finucane is manager.

During the year the mill at the McKinley mine was enlarged to a daily capacity of 225 tons, and the Savage sorting plant was closed down, mill ore from the Savage being conveyed to the McKinley mill by aerial tram.

The following table shows the underground work at the McKinley-Darragh mine during 1913:

Levels	Drifts	Cross-cuts	Raises	Stopes
feet	feet	feet	feet	tons
110	806.5	914	27.5	9,698
135	40.	.....	.....	3,158
150	1,216.5	964	298.5	15,088
200	109.5	54.5	9	8,571
225	.....	.....	.....	397
240	57.5	23.5	.....	668
250	673	352	164	577
Totals.....	2,903	2,308	499	38,157



The distribution of underground work during 1913 at the Savage mine is shown in the following table:—

Levels	Drifts	Cross-cuts	Raises	Winzes	Stopes
feet	feet	feet	feet	feet	tons
90	.....	73.5	.....	.....	.....
140	1,101	1,130.5	196.5	77	3,137
180	73	.....	12.5	.....	231
190	94	544	71.5	28	2,010
200	16	11	.....	.....	.....
210	.....	.....	22.5	.....	.....
240	73	21	18	.....	152
245	.....	.....	37	.....	54
Totals.....	1,357	1,780	358	105	5,584

During the year the mill treated 63,016 tons of ore, from which 1,446,252 ounces of silver were recovered.

Including metallics and high-grade ore, the production of silver during the year was 2,214,036 ounces, bringing the total up to January 1st, 1914, to 12,984,212 ounces.

#### Meteor

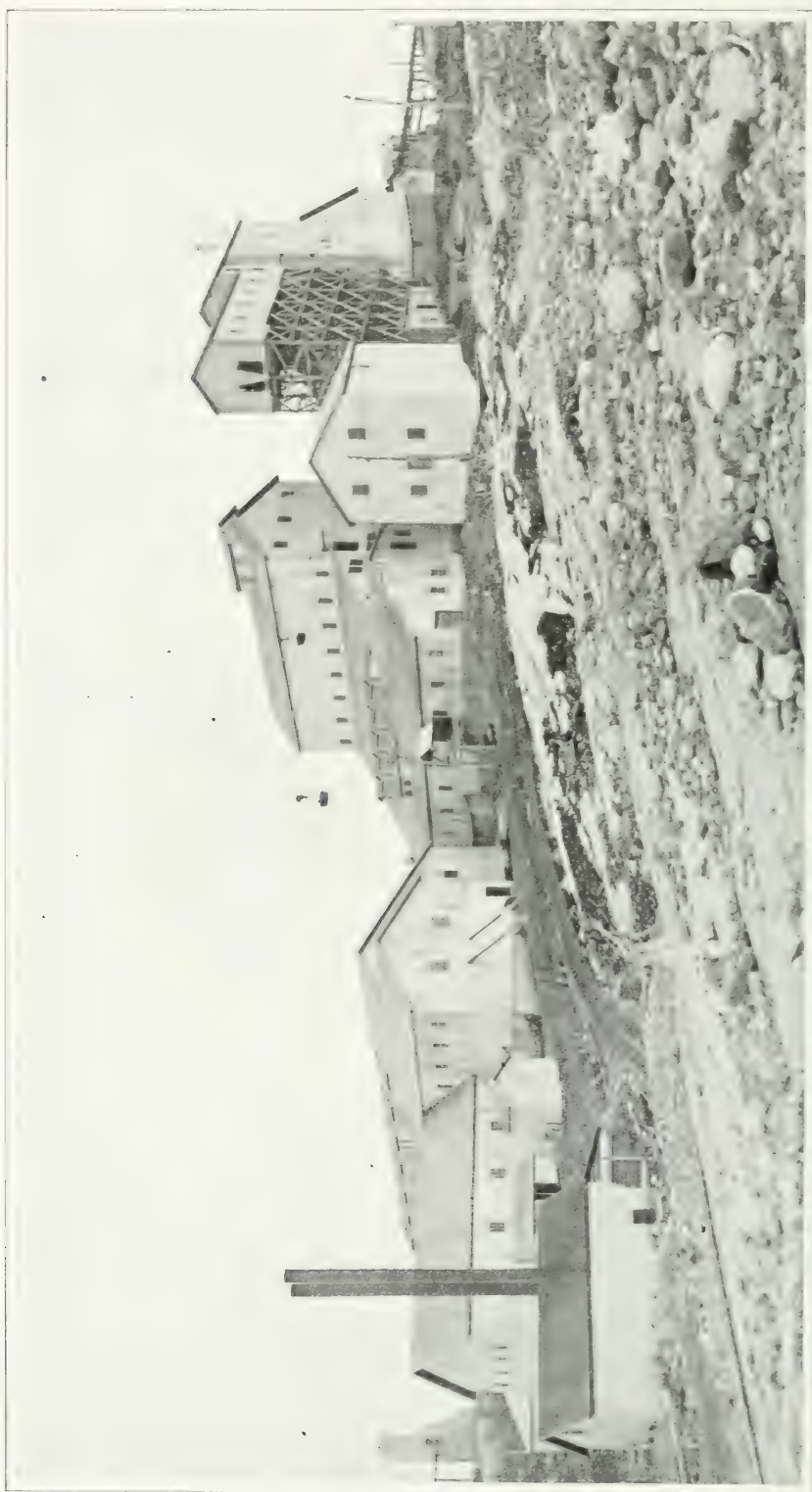
The Meteor Silver Mining Company have been working on their property on the northwest corner of Diabase mountain with a force of seventeen men. They have two shafts, one vertical 275 feet in depth, and one sunk on the incline under the mountain to a depth of 336 feet. The work done during the year consists of 50 feet of sinking; 42 feet of raising, 130 feet of cross-cutting, and about 200 feet of drifting.

A 25-h.p. boiler is used for heating purposes, and three small hoists run by air are in use.

Mr. D. D. Flanagan is manager.

#### Nipissing

The Nipissing Mining Company, Limited, with an authorized capital of \$250,000, own and operate 846 acres in the township of Coleman, principally situated in the producing area. Mr. David Fasken, of Toronto, is president; Mr. R. B. Watson, general manager, and Mr. Hugh Park, manager. The Nipissing Mines Company is a holding company, owning all the stock of the Nipissing Mining Company, and have an authorized capital of 1,200,000 shares of a par value of \$5.00 each. The officers and directors of the company are as follows: Mr. E. P. Earle, New York, president; Mr. R. T. Greene, New York, secretary; Messrs. W. H. Brouse, Toronto, Duncan Coulson, Toronto, David Fasken, Toronto, R. T. Greene, New York, M. A. Viele, New York, August Heclescher, New York, Dennis Murphy, Ottawa, and R. B. Watson, Cobalt, directors.



Nipissing Low-grade Mill

—Photo copyrighted by Arthur A. Cole.

The general manager's report for 1913 shows the work done to be distributed as follows:

Shaft No.	Drifting	Cross cutting	Raising	Sinking	Total	Stopping
	feet	feet	feet	feet	feet	cub. yds.
8	242.0	271.0	103.5	9.5	626.0	289.0
63	1,148.5	375.5	232.5	.....	1,756.5	2,322.0
64	173	592	.....	225.5	990.5	245.3
73	2,287	2,798.5	848.0	70.0	6,003.5	28,407.9
80	257.0	217.5	32.5	.....	507.0	11,762.1
86	474.0	402.5	40.5	105.0	1,022.0	.....
92	176.5	72.0	.....	.....	248.5	421.3
122	572.5	436.0	49.0	.....	1,057.5	570.1
150	791.0	662.0	.....	.....	1,453.0	.....
Total.....	6,121.5	5,827.0	1,306.0	410.0	13,664.5	44,017.7

The general manager gives the following table of production of individual veins for 1913:

	Silver in High Grade Ore	Silver in Mill Rock	Total
	oz.	oz.	oz.
Vein 8.....	1,091	.....	1,091
Shaft 63 and Little Silver.....	293,435	192,963	486,398
Shaft 73 : Veins, 64, 73, 80, and 100 .....	2,147,515	1,767,828	3,915,343
Vein 96.....	.....	20,051	20,051
Vein 122.....	104,677	4,367	109,044
Vein 128.....	6,003	.....	6,003
H 2, 5 and 35 .....	14,243	.....	14,243
	2,566,964	1,985,209	4,552,173

Surface prospecting by means of a hydraulic jet was carried on from May 3rd to December 6th. At night operations were conducted with the aid of a searchlight. The area cleared was 54.69 acres; the average depth of overburden, 3.9 feet.

Six diamond drill holes, aggregating 2,239 feet, were put down in the diabase area of R. L. 408.

Shaft No. 64 will reach the 900-foot level early in 1914, at which level it is intended to do considerable development work.

Regarding operations at the metallurgical plants of the company, the general manager in his annual report states:

*High-grade Mill.*—The reduction works for high-grade ore treated 1,200 tons of Nipissing ore, averaging 2,501 ounces per ton, and 632 tons of custom ores, averaging 2,854 ounces per ton. The precipitate from the low-grade mill was also sent to the high-grade plant for melting and refining. Total shipments of bullion during the year amounted to 6,530,871 fine ounces.

The residue from the high-grade mill carries 20 to 40 ounces silver, 8 to 10 per cent. cobalt, 4 to 6 per cent. nickel and 30 to 40 per cent. arsenic. This is sold to the manufacturers of cobalt products and during the year shipments of 1,659 tons were made, which netted the company \$62,484.

The only new construction during the year consists of a baghouse for the fumes from the furnaces and retorts.

A great deal of research work has been carried on, with the object of improving the method for treating high-grade ore and concentrate produced in the Cobalt district.

By applying the principles successfully used in the reduction of low-grade ore, it is hoped that a method will be worked out whereby the higher grade ore can be treated to advantage by cyanide only.

*Low-grade Mill.*—The record for 1913 is as follows:

	Tons	Assay oz.	Silver oz.
Ore treated .....	77,133	27.182	2,096,611
By-products treated .....	107		54,383
Total milled .....	77,240		2,150,994
Bullion recovered from above .....			1,985,209

From the start of the mill, November 11, 1912, to December 31, 1913, the actual recovery has been 91.85 per cent.

All ore going to the mill is weighed on a registering beam scale and the contents of the ore is based on this weight and on an automatic sample of the 200-mesh pulp as it enters the cyanide plant.



New 80-Stamp Mill of Northern Customs Concentrators, Limited

Two features made possible the above extraction on these complex ores, which have heretofore resisted successful treatment by cyanide alone. One is the desulphurizing process originated at Nipissing, whereby the fine pulp is subjected to contact with metallic aluminum in a caustic soda solution. This treatment breaks up most of the refractory silver combinations and reduces the silver to the metallic state, so that it goes into solution easily in the subsequent treatment by cyanide. The other feature is the use of aluminum dust for precipitation instead of zinc dust. The resulting precipitate runs over 90 per cent. silver and is melted down into commercial bars 996 fine or better.

#### O'Brien

The following table shows the development in the several shafts during 1913, the greater part of which was done in the diabase:

	No. 1	No. 2	No. 6	Main	Total
	ft.	ft.	ft.	ft.	ft.
Raising and Sinking.....			144		144 lineal
Drifting and cross-cutting...	102	219	1,959	320	2,600 "
Stoping.....					28,000 tons



A new tube mill and additional tanks which were added in the cyanide plant towards the end of the year increased the milling capacity by 1,000 tons per month; 40,000 tons were milled during 1913. The total production from high-grade ore, concentrates and bullion amounted to 1,212,013 fine ounces of silver.

Mr. M. J. O'Brien is owner, and Mr. R. H. James manager.

#### Penn-Canadian

The officers and directors of the Penn-Canadian Mines, Limited, are: Mr. W. J. Haines, president; Mr. R. B. Haines, secretary-treasurer; Mr. Spencer D. Wright, Mr. E. C. R. Laidlaw, Mr. Alfred S. Elliott. The general office of the company is at 1011 Chestnut street, Philadelphia, Pa.

The development work during 1913 was as follows: cross-cutting and drifting, 2,752 feet; raising, 326 feet; winzes, 47 feet; average number of men employed, 96.

During the year the mill treated 16,648 tons of Penn-Canadian ore and 3,156 tons of customs ore.

Mr. B. Neilly is general superintendent.

#### Peterson Lake

The Peterson Lake Silver Cobalt Mining Company, Limited, operate under Peterson lake, and lease to two other operating companies, the Seneca-Superior Mining Company and the Gould Consolidated Mining Company, portions of the bed of Cart lake. Sir Henry Pellatt is president, Mr. G. F. Morrison, secretary-treasurer, Mr. R. B. Lambe, consulting engineer, and Mr. W. C. West, manager.

The company were operating during the year in No. 1 shaft, situated near the narrows between Cart and Peterson lakes. Sinking in this shaft amounted to 217 feet and the total driving in three cross-cuts to 620 feet. At shaft No. 2, on the old Kerry lease, the mine was unwatered and the shaft repaired in preparation for the commencement of work. A new dry and an ore house were erected here.

#### Provincial

The Cobalt Provincial Mining Company, Limited, operated their property throughout the year, with an average force of eighteen men.

The officers are as follows: Mr. John F. Milliken, president; Mr. John Redington, vice-president and general manager.

The development consisted of 90 feet of drifting and about 900 feet of cross-cutting.

#### Right of Way

The Right of Way Mines, Limited, operated continuously during the year.

The underground work was as follows:

Sinking . . . . .	225 feet
Cross-cutting . . . . .	1,215 feet
Drifting . . . . .	150 feet

No. 2 shaft, at the north end of Cobalt lake, was sunk from the 150-foot level to a depth of 375 feet, and a station cut at 365 feet; 650 feet of cross-cutting was done on this level. In December No. 3 shaft was unwatered, in order to prospect on the 120-foot level for the continuation of a vein found on the Princess property.

On July 1st the company rented the Colonial mill. The mill was operated 165.3 days and 5,013 tons of ore treated; 52,690 oz. of silver were recovered.

# Geological Map of PETERSON LAKE SILVER COBALT M<sup>NG</sup> C<sup>O</sup> L<sup>TD</sup> Showing Leases

Scale

1000 400 800 1200 1600 2000 FEET

LEGEND

## KEWEENAWAN SERIES


 Nipissing Diabase  
*Intrusive Contact*

## COBALT SERIES

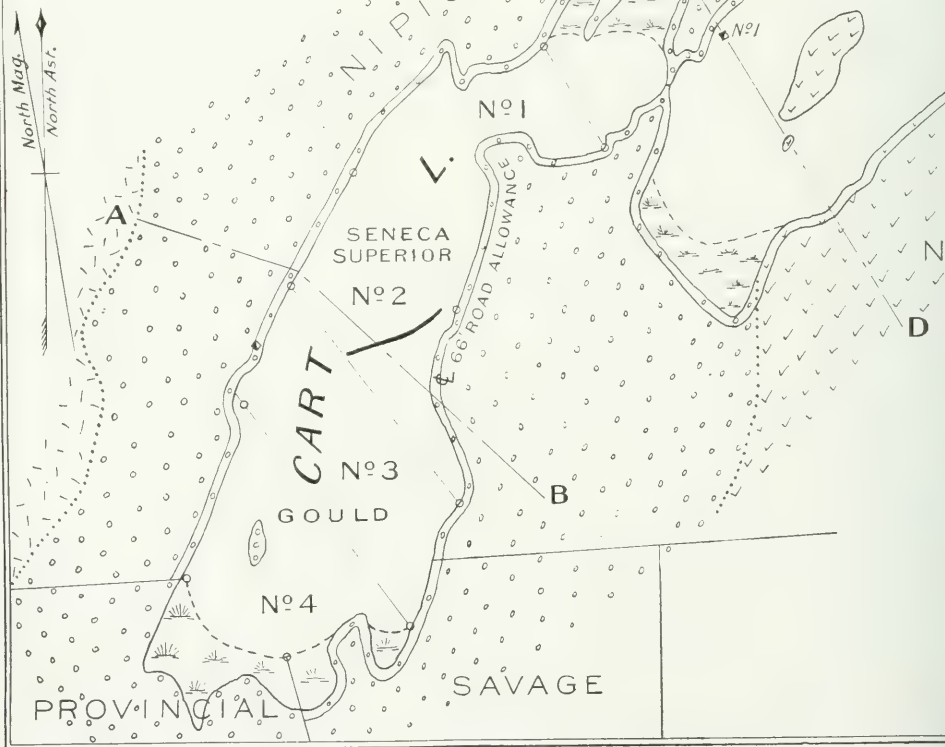
 Conglomerate, greywacké, quartzite  
*Unconformity*

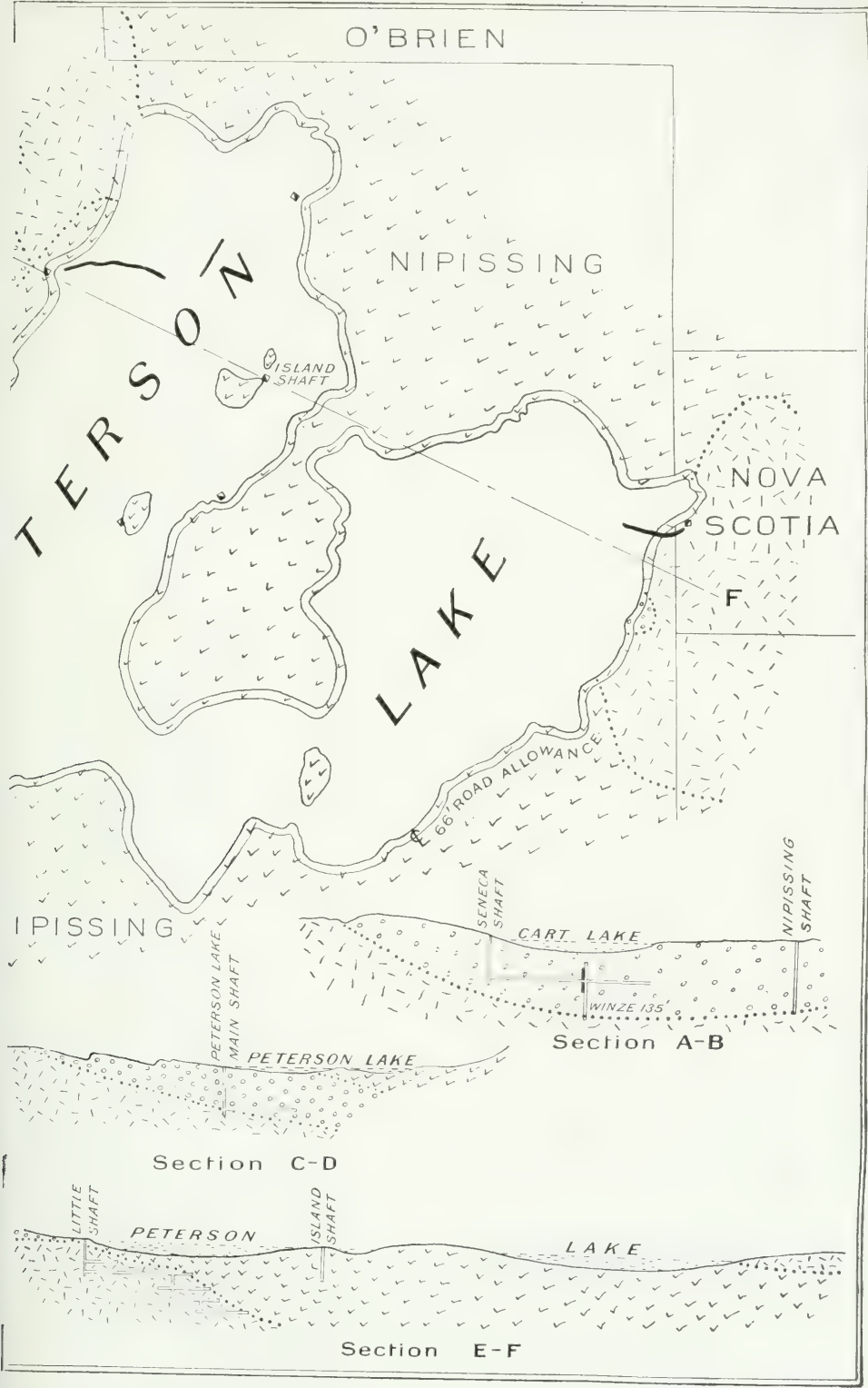
## KEEWATIN SERIES

 Greenstone complex

 Shaft

 Vein







No. 2 Shaft. Peterson Lake Silver Cobalt Mining Company, Limited



**Seneca-Superior**

The Seneca-Superior Silver Mines, Limited, are operating the leases on Peterson and Cart lakes formerly held by the Kerry Mining Company. The company have an authorized capital of 500,000 shares of a par value of \$1.00.

The officers of the company are: Mr. S. Harry Worth, president; Mr. F. W. Zoller, vice-president; Mr. R. F. Segsworth, treasurer; Mr. W. E. Segsworth, consulting engineer; Mr. R. H. Lyman, mine manager.

The development during 1913 was as follows:

Drifting on veins .....	645.4 feet
Drifting on exploration .....	3,453.5 feet
Sinking and raising .....	350.6 feet

No. 2 shaft was completed to the 200-foot level and connected on this level with No. 1 shaft. A winze was sunk from the west end of the 200-foot level, near the Gould line, a distance of 145 feet, and levels opened up at 65 and 135 feet from the collar of the winze.

During the year 1,174,000 oz. of silver were produced, and \$263,136.20 paid in dividends.

**Silver Bar**

The Silver Bar mine was operated during the year, under lease, by the Preston East Dome Mining Company, Limited, an average force of ten men being employed.

Drifting and cross-cutting totalled 800 feet; a winze was put down from the 80- to the 120-foot level; the raising amounted to 60 feet.

Mr. Stuart M. Thorne is manager.

**Temiskaming**

This property, consisting of the south half of the northeast quarter and the west half of the southwest quarter of the north half of lot 1, in the third concession of Coleman, is owned by the Temiskaming Mining Company, which have an authorized capital of 2,500,000 shares of a par value of \$1.00. The officers and directors of the company during 1913 were as follows: Mr. Burr E. Cartwright, Buffalo, president; Mr. J. L. Wheeler, Marion, S.C., vice-president; Mr. Alex. Fasken, Toronto, secretary-treasurer; Mr. R. A. Cartwright, Ridgeway, Pa.; Mr. Ernest C. Whitbeck, Rochester, N.Y., and Mr. Wallace Thayer, Buffalo, N.Y., directors; Mr. Norman R. Fisher, Cobalt, general manager.

During the year a working option was taken on the Duchess property, adjoining the Temiskaming on the south, with the intention of continuing the present shaft on this property to the 250-foot level, where extensive exploratory work will be prosecuted.

The main shaft on the Temiskaming is being continued from the 650-foot level to the 750-foot level.

The underground work accomplished during the year is shown in the following table, taken from the company's annual report:

Level	Drifting	Cross cutting	Sinking Winzes	Raising	Sinking Shaft	Total
ft.	ft.	ft.	ft.	ft.	ft.	ft.
90	.....	30.0	.....	.....	.....	30.0
200	.....	.....	.....	.....	.....	.....
250	25.6	24.0	.....	.....	.....	49.6
300	242.7	73.9	.....	50.0	.....	366.6
350	.....	.....	.....	.....	.....	.....
400	83.0	127.3	.....	15.0	.....	225.3
450	182.1	89.4	.....	12.4	.....	283.9
500	258.4	104.0	18.0	34.4	.....	414.8
575	963.1	164.9	38.0	235.8	.....	1,401.8
650	1,044.7	253.5	89.3	117.0	9.1	1,513.6
725	83.7	17.3	.....	10.0	.....	111.0
Totals....	2,883.3	884.3	145.3	474.6	9.1	4,396.6

During the year the mill treated 32,307 tons of 18½-oz. ore, producing 483,796 oz. of silver, a recovery of 81 per cent. The ratio of concentration was 62 into 1.

The production from high-grade ore was 255,930 oz. of silver; the grade averaged over 4,000 oz. per ton, most of this being produced from the diabase formation.

#### Trethewey

This property is owned and operated by the Trethewey Silver Cobalt Mine, Limited, which have an authorized capital of 2,000,000 shares of a par value of \$1.00, of which 1,000,000 shares have been issued.

The officers of the company are as follows: Mr. Alex. M. Hay, Haileybury, president; Mr. Sidney Small, Toronto, vice-president; Mr. J. L. Pashler, secretary-treasurer; Mr. David Fasken, Toronto, Messrs. W. J. Sheppard, Waubauskene, Jas. B. Tudhope, Orillia, and S. R. Wickett, Toronto, directors; Mr. D. L. H. Forbes, Toronto, consulting engineer; Mr. H. G. Young, Cobalt, manager.

The development during the year amounted to 2,194.5 feet of drifts and cross-cuts; 555.5 feet of winzes and raises; 198 cubic yards of station and grade cutting. The greatest production during the year came from the southwest area, or Nos. 2 and 5 shaft sections.

The mill treated 35,282 tons of ore of an average value of 21.2 oz. at a total cost of \$1.46 per ton. The tonnage milled was 32.1 per cent. greater in 1913 than in 1912, and the cost per ton 25.2 per cent. less. The crushing plant was remodelled during the year.

The total production of silver for 1913 amounted to 619,427 oz.; \$150,000 was paid in dividends.

A working option was taken on the West Beaver mine in the Port Arthur district.

#### York-Ontario

The York-Ontario Silver Mines, Limited, operated under lease the King Edward Silver Mines during ten and one-half months of 1913.

Mr. Geo. H. Beebe, of Syracuse, N.Y., is president; Mr. H. E. Jackman, vice-president; Mr. T. S. Shuttleworth, manager.

The drifting and cross-cutting done during the year amounted to about 450 feet, of which 120 feet was done on the 500-foot level. A diamond-drill hole was put down 650 feet from the 500-foot level, and encountered the lower Keewatin contact at a depth of about 1,100 feet. It is the intention of the management to sink to and explore the vicinity of this lower contact.

The King Edward mill was operated under lease by the City of Cobalt Silver Mining Company for the first five months of the year. It was then taken over by the King Edward Silver Mines, and ore from the York-Ontario was treated for about four months.

#### Elk Lake Area

##### Beaver Auxiliary

Operations were carried on at this property by Manager H. L. Donaldson, with a force of 25 men, until about the end of the year, when the mine was closed down for the winter on account of lack of water. The main shaft has been continued to a depth of 220 feet, the development at the 200-foot level comprising about 400 feet of drifts and cross-cuts.

The plant consists of two 90-h.p. boilers, an 8-drill compressor, a 6 by 8 hoist, and a 100-light generator for electric lighting. Ample supplies are being taken in for next season's operations.

**Cobalt Frontenac**

This property, situated in lot 7 of the first concession of Tudhope township, is owned by a Hamilton syndicate, of which Mr. Fletcher is managing director. Mr. C. D. Booth is superintendent.

A plant, comprising a 100-h.p. boiler, a 4-drill compressor, and a hoist, has been installed.

A shaft has been sunk to a depth of 200 feet. Two levels have been driven to intersect some mineralized quartz veins, the cross-cutting on each amounting to 150 and 200 feet, and the drifting on the 200-foot level to about 100 feet.

**Fleur de Lis**

The Fleur de Lis Silver Mining Company, Limited, have continued operations on the northwest quarter of lot 7 in the first concession of Smythe township. The shaft has been sunk to a depth of 260 feet, and the vein cut at a distance of 20 feet north on the 250-foot level. Drifting was in progress with one drill.

The plant consists of an 18-h.p. boiler and a 6 by 8 hoist.

Mr. E. Bassette is in charge.

**Forest City**

The Forest City Mines Syndicate operate what are known as the Currie claims at Hubert lake. The shaft has been sunk 100 feet under contract by Mr. G. W. Wheeler. Mr. James Day is in charge.

**Mapes-Johnston**

The Mapes-Johnston claim, near Silver lake, in the township of Mickle, was being worked with a force of ten men, under the superintendence of Mr. D. G. Oliver. The workings consist of a prospecting shaft 85 feet deep, and a working shaft 100 feet in depth, with 130 feet of drifting at that level.

The Montreal-James plant has been purchased and is being transferred to the property.

**Downey**

Mr. Larry Downey has been conducting mining operations on his claim near Silver lake with a small force of men. Ten tons of high-grade ore have been taken out from an open cut, and are awaiting shipment when the sleigh roads become good. This will be the first shipment from the Montreal River district since 1910, when the Lucky Godfrey shipped a car of ore.

**Moose Horn**

The Moose Horn mines were being operated until nearly the end of the year. About 1,000 feet of drifting has been done on the 125-foot level. Two winzes have been sunk to depths of 50 and 75 feet below this level.

Mr. Albert Pardon was in charge.

**Paragon**

The Paragon Silver Mining Company, Limited, have been engaged sinking a shaft on one of their claims in Willet township. This shaft is 90 feet in depth.

The plant consists of a 50-h.p. boiler; a hoist has been ordered.

Mr. Joseph P. Welsh was in charge, with a force of eight men.

## Gowganda

### Caleta

The Caleta Silver Mines, Limited, formerly the Calcite Lake Mining Company, were operating their claim in Lawson township with a force of 15 men; operations, however, were suspended early in 1914. The shaft has a depth of 285 feet, the development therefrom consisting of 340 feet of drifts and 310 feet of cross-cuts, mainly at the 200-foot level.

The plant consists of two boilers, with a total of 85-h.p., a 3-drill compressor, and an 8 by 10 hoist.

Mr. John Wilson is captain, and Mr. A. D. McMillan managing director.

### Dowling

At the Dowling claim, near Bloom lake, a shaft was being put down from the 45-foot to the 100-foot level. Mr. Donald McRae was the contractor.

### Thompson-Gowganda or Gamey-Thompson

At the Thompson-Gowganda claims, northwest of Spawning lake, some drifting was being done by contract, on the adit level, by Mr. Donald McRae.

### Hewitt

The Hewitt Lake Mining Syndicate suspended operations on their claims on the west ridge in Nicol township in December, in order to add a compressor to their plant. This plant will then comprise: two boilers with a total capacity of 50-h.p., a 3-drill compressor, and a hoist.

The shaft has a depth of 150 feet, with levels at 50 and 150 feet. Drifts total 180 feet, and cross-cuts 50 feet.

Mr. M. F. Cottrell is manager.

### Mann

The Mann Mines have been operating, with a force of 25 men. Early in 1914 the control of the property passed to an English syndicate, and there are prospects of operations being conducted on a larger scale. There are in all five shafts, with depths varying from 40 to 200 feet, and about 3,000 feet of drifts and 740 feet of cross-cuts, inclusive of the Boyd-Gordon workings. Stopping was in progress at the beginning of 1914.

The plant consists of four boilers with a total capacity of 150-h.p., a compressor with a capacity of 580 cubic feet per minute, and four hoists.

Mr. G. R. Rogers is manager.

### Miller Lake-O'Brien

Developments have been very satisfactory at this property during the year. The main shaft has reached a depth of 450 feet, and the production is being maintained from the levels down to 350 feet.

The underground force numbers 45 men, and the total employees 145.

The present plant consists of six boilers with a total of 400 h.p., three compressors with a capacity of 2,640 cu. ft., and six hoists.

This report includes the Millerett property as well, on which considerable surface prospecting was done during the past summer. Important discoveries were made on both properties. A new shaft, which is being put down on the ore on the Millerett, has reached a depth of 25 feet.

A new hydro-electric plant, to develop 500 h.p., is being installed on the east branch of the Montreal river at Gowganda townsite. The mine plant is being electrified, and a new motor-driven compressor of 2,000 cu. ft. capacity is being added.

Mr. K. D. Woodworth is manager.



**Walsh**

The Walsh Mines, Limited, at Miller lake were timbering the first 50 feet of their shaft, preparatory to sinking another 50 feet.

Mr. Robert Gamble is manager.

**South Lorrain****Wettlaufer-Lorrain**

The Wettlaufer-Lorrain Silver Mines, Limited, authorized capital of 1,500,000 shares of a par value of \$1.00 each, operated until October 31st, 1913, when it was decided to cease active work at the property.

The officers of the company are as follows: Mr. Henry Lockhart, Jr., president; Mr. Julius A. Lewisohn, vice-president; Mr. E. H. Westlake, secretary-treasurer; Mr. Robert Livermore, manager.

During the year \$141,659 was paid in dividends.

The development during the year was as follows:

Drifts . . . . .	755 feet
Cross-cuts . . . . .	357 feet
Raises and winzes . . . . .	278 feet
	<hr/>
	1,390 feet
Surface trenching . . . . .	127 feet
Diamond-drilling . . . . .	982 feet
	<hr/>
Total . . . . .	2,499 feet

**Porcupine Gold Area**

The year 1913 was the most successful in the history of this gold area. On June 9th the miners' strike was allowed to lapse. During the year new mills were completed at the Porcupine Crown, McIntyre and Dome Lake, the Dome mill was increased from 40 to 80 stamps, and the capacity of the Hollinger mill raised from 300 to 500 tons a day. Porcupine Crown was the second Porcupine property to go on a dividend-paying basis. On January 1st, 1914, a dividend of 12 per cent. per annum, payable quarterly, was declared.

The successful results attained by the operating companies have led other companies to invade this field. The McKinley-Darragh Savage Company are developing the Jupiter mine. The General Development Company took an option on the Hollinger Reserve mine. The Temiskaming and Hudson Bay Mining Company financed the Dome Lake. The Huronian Belt Syndicate are developing the North Thompson; the Vipond mine has been reorganized; the Homestake Mines and Finance Company are developing the Foley-O'Brien, Little Pet and Porphyry Hill properties.

**Acme Gold Mines, Ltd.**

The Acme Gold Mines, Limited, operate the Dixon claims adjoining the Hollinger on the east, being controlled by the Canadian Mining and Finance Company, Limited, of which the officers are: Mr. L. H. Timmins, president; Mr. J. McMartin, vice-president; Mr. D. A. Dunlap, treasurer; Mr. J. B. Holden, secretary; Mr. P. A. Robbins, general manager.

There are four shafts on the property, with depths respectively of 175, 325, 115, and 30 feet. The development work during 1913, which was all done in the latter part of the year, comprises: 134 feet of sinking, 515 feet of drifting, and 613 feet of cross-cutting, or a total of 1,262 feet.

The employees number 71, of which 46 are underground.

The plant consists of one 30-h.p. boiler for heating purposes, a compressor of 1,500 cubic feet capacity, three 10 by 12 hoists, one 8 by 10 hoist, one 6 by 8 hoist, two 500-k.w. transformers, and one 30-h.p. motor.

Mr. H. G. Skavlem is manager.

#### Dome

The mines operated by the Dome Mines Company, Limited, are situated on the north half of lot 4 in the first concession of Tisdale township. The company have an authorized capital of 500,000 shares, with a par value of \$10.00 each. The officers of the company are: Mr. Ambrose Monell, president; Mr. W. W. Mein, consulting engineer; Mr. H. C. Meek, general superintendent.

The results for the year ending March 31st, 1914, are shown in the following summary of development in feet:



80-Stamp Mill at Dome Mine

Total of all development, 100-foot level, shaft No. 1 . . . . .	1,607
Total of all development, 200-foot level, shaft No. 2 . . . . .	49
Total of all development, 3rd level, shaft No. 2 . . . . .	3,098
Total of all development, 4th level, shaft No. 2 . . . . .	744
Total of all development, 5th level, shaft No. 2 . . . . .	1,081
	<hr/>
	6,579
Sinking . . . . .	223
	<hr/>
	6,802

Mining operations were as follows:

Total ore from pits . . . . .	122,965 tons
Total ore from development . . . . .	17,699 tons
Total ore from stopes . . . . .	4,782 tons
	<hr/>
	145,446 tons
Total ore to mill . . . . .	145,446 tons
Total waste to dump . . . . .	18,896 tons
	<hr/>
Total tonnage mined . . . . .	164,342 tons

The following figures show mill operations and results:

Tons milled . . . . .	145,300
Yield by amalgamation . . . . .	\$731,229 94
Yield by cyanidation . . . . .	\$473,033 80
	<hr/>
Total value . . . . .	\$1,204,263 74
Value per ton . . . . .	8 29
Per cent. value recovered . . . . .	94.43
Average number of tons treated per day . . . . .	398

There have been installed three new Farrell jaw crushers, which replace the gyratory crushers formerly in use. One, 36 by 24, replaces the 7½ gyratory crusher, and two, 36 by 10, replace the two No. 3 gyratory crushers.

A new electrically-driven Ottumwa hoist now replaces the old steam hoist formerly used on the incline.

The system of selective stoping, which has been followed underground at the Dome mine in the past, is being superseded by a method by which the whole ore body will be mined, and the production of the mine greatly increased. By this method rib pillars and stopes 40 feet in width are carried right across the ore body. The main haulage way is driven parallel to the long axis of the ore body, and the drifts through which the ore is taken from the stopes are run off at right angles to the main drive.

Mr. W. F. Battersby, mill superintendent, gives the following information regarding additions to the present mill:

The addition to the Dome mill now under way will consist mainly of 40 stamps and six sand-leaching vats. The pulp from the 80 stamps will pass to five duplex Dorr classifiers, the oversize going to five 5 by 22-foot tube mills. The discharge from these tube mills, joined by the overflow from the classifiers, will, after first passing over secondary amalgamation plates, be elevated by bucket elevators to a system of cones, where it will be classified into sands and slimes, the former passing to the six sand-leaching vats, and the latter to four Pachuca agitators now being used in the present mill. From these agitators the slime will be drawn as at present to Merrill slime presses, and the gold-bearing solution precipitated in Merrill precipitating presses. The completed mill is expected to treat 750 tons of ore daily.



New Mill and Shafthouse at Dome Lake Mine

#### Dome Lake

The control of the Dome Lake Mining and Milling Company passed during the year to the Temiskaming and Hudson Bay Mining Company. Mr. George Taylor is the new president, and the head office has been transferred to New Liskeard, Ontario. The transfer was made in November. Mr. A. H. Brown is the manager, and Mr. G. C. Cochrane is superintendent.

The following is a summary of the work done on the property up to the end of the year 1913:

#### Sinking—

"A" shaft, No. 1 vein . . . . .	60 feet	
"C" shaft, No. 3 vein . . . . .	193 feet	
"D" shaft, No. 3 vein . . . . .	135 feet	
Main shaft, No. 3 vein . . . . .	235 feet	
		623 feet
Winze on 115-foot level, No. 3 vein . . . . .		42 feet

## Drifting—

60-foot level, No. 1 vein . . . . .	275 feet
60-foot level, No. 3 vein . . . . .	640 feet
115-foot level, No. 3 vein . . . . .	1,070 feet
180-foot level, No. 3 vein . . . . .	798 feet
	<hr/> 2,713 feet

## Cross-cutting—

On 60, 115 and 180-foot levels . . . . .	696 feet
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## Raising—

On 60, 115 and 180-foot levels . . . . .	571 feet
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Total footage . . . . .	<hr/> 4,645 feet
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The sinking done during the year comprises the winze, 42 feet, and 123 feet in the two deeper shafts. Of the drifting and cross-cutting, which totals about 4,000 feet, about 2,000 feet was done during 1913.

The ten-stamp mill was operated during May, June and July, and crushed 3,717 tons, from which there was recovered by amalgamation \$19,762.00, and by concentration \$5,607.00.

## Foley-O'Brien

Work has been resumed in the main shaft of the Foley-O'Brien Mines, Limited. This has a depth of 168 feet, and a winze has been sunk from the 160-ft. level to a depth of 90 feet. There are two other shafts on the property with depths of 70 and 100 feet respectively. Drifts and cross-cuts total 900 feet.

The plant consists of two 50-h.p. boilers, two compressors with a capacity of 600 cubic feet, and three hoists.

Mr. H. B. Hatch is manager, employing a force of 20 men.

## Holling

The holdings of the Hollinger Gold Mines, Limited, consist of four 40-acre claims, comprising the east half of the north half and the northeast quarter of the south half of lot 11, and the northwest quarter of the south half of lot 10, in the second concession of Tisdale.

The company have an authorized capital of \$3,000,000, divided into 600,000 shares of a par value of \$5.00. Mr. Noah Timmins is president; Mr. D. A. Dunlap, secretary-treasurer; and Mr. P. A. Robbins, general manager.

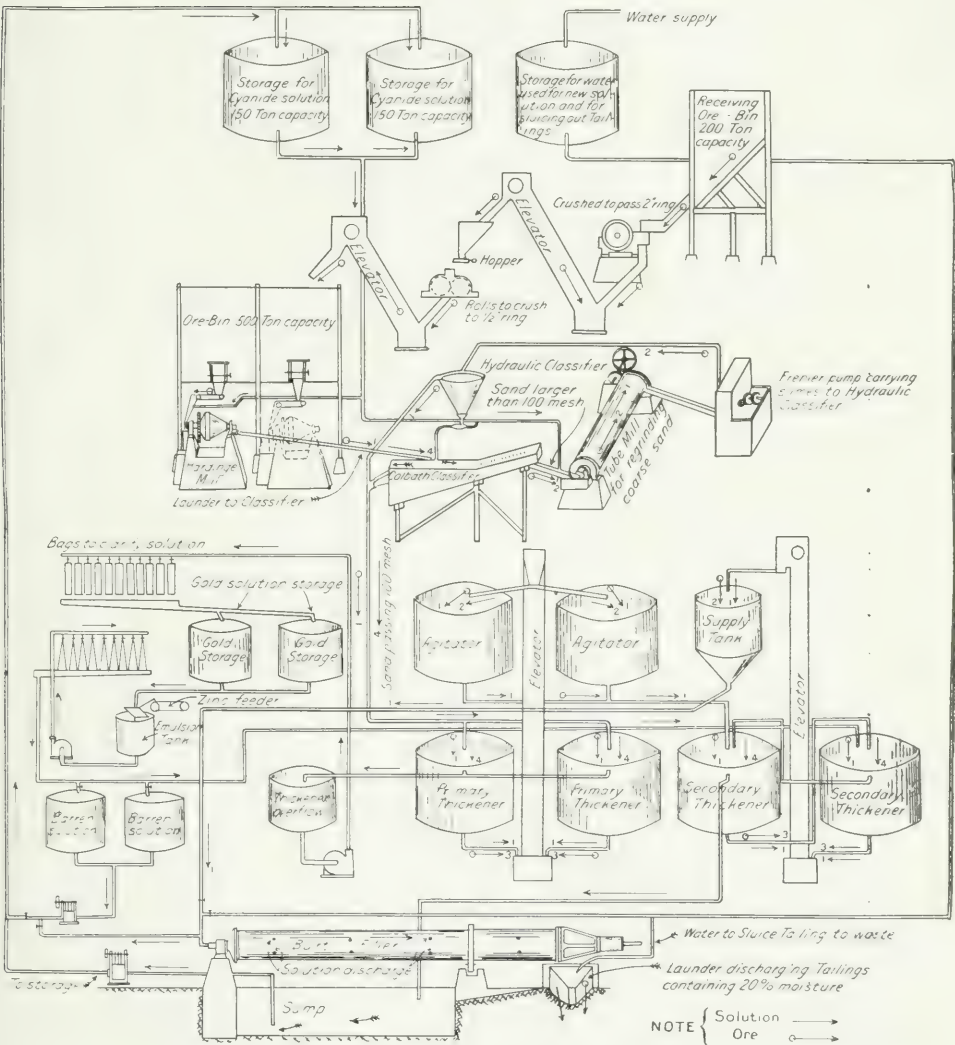
The third annual report of the company shows that during 1913, 138,291 tons of ore were treated, yielding \$2,466,220.24, that \$1,170,000 were paid in dividends, and that the ore reserves were increased by \$3,000,000.

During the year the following work was accomplished:—

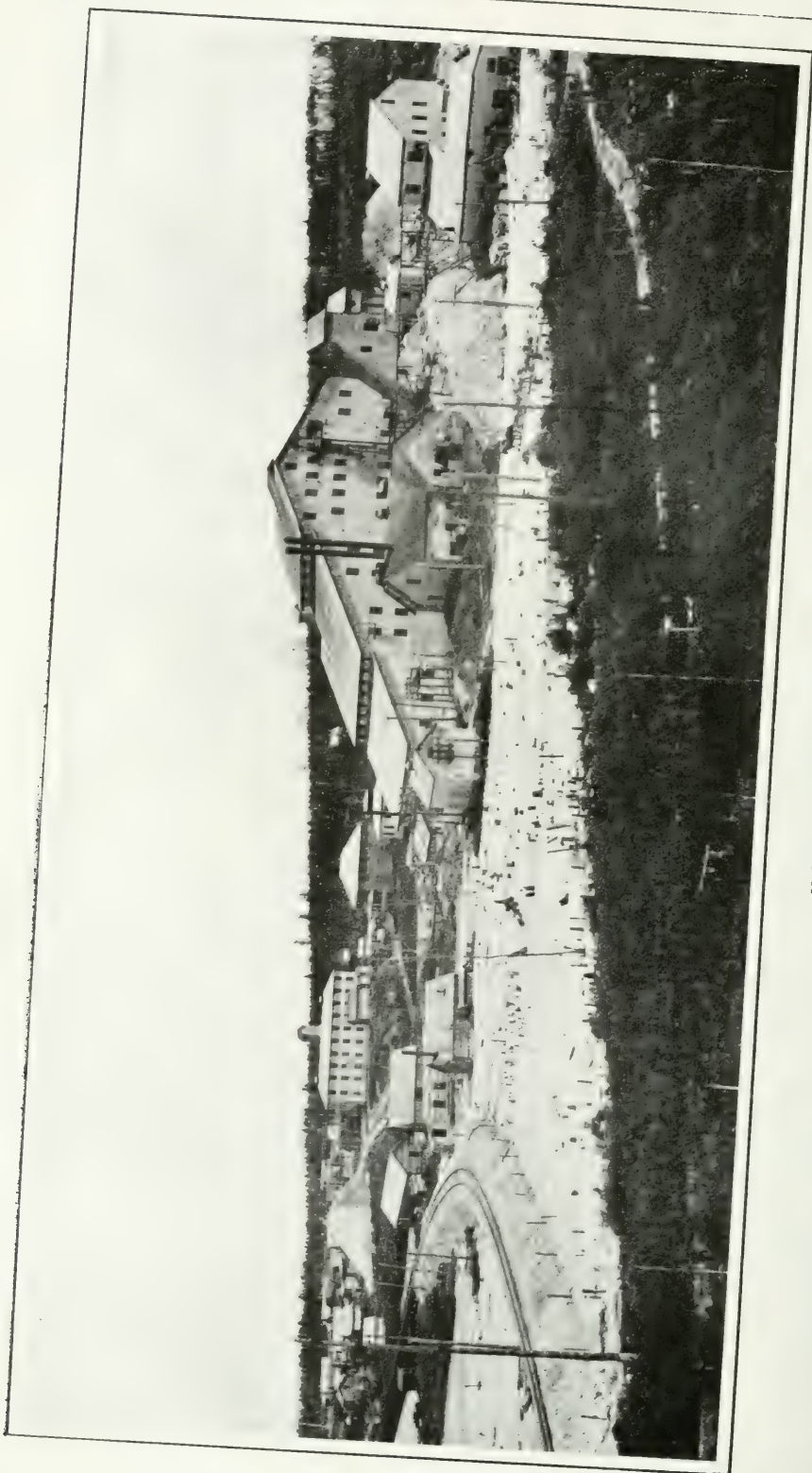
—	Drifts	Crosscuts	Raises	Winzes	Shafts	Diamond Drilling	Trenches
	ft.	ft.	ft.	ft.	ft.	ft.	ft.
Surface . . . . .	.....	8	.....	.....	253	601	550
100 ft. level . . . . .	1,031	250	.....	.....	.....	784	.....
200 ft. level . . . . .	1,524	240	323	.....	.....	790	.....
300 ft. level . . . . .	1,351	238	.....	130	115	383	.....
425 ft. level . . . . .	243	212	11	82	.....	93	.....
Totals . . . . .	4,149	948	334	212	368	2,651	550

During the year \$46,832 was expended upon bunk houses and dwellings. The former consist of plastered rooms, two single beds in a room; they are supplied with steam heat, electric light, and modern sanitary arrangements.





Flow Sheet of McIntyre-Porcupine Mill. Numbers Before Arrows Denote Relative Solution to Ore



McIntyre-Porcupine Gold Mine

*Copyright, Canada, 1913, by C. Tompkinson*

#### Hollinger Reserve

Active development work has been carried on at the property of the Hollinger Reserve Mining Company in Ogden township during 1913, consisting of the following: cross-cutting, 210 feet on the 100-ft. level, and 187 feet on the 200-ft.; drifting 150 feet on the 100-ft. level, and 1,200 feet on the 200-ft.; a winze sunk 118 feet from the 200-ft. level; 300 feet of drifting on the 300-ft. level.

During the year the property was taken over under option by interests allied to the Kerr Lake Mining Company.

Mr. H. W. Evans is manager, employing 40 men.

#### McIntyre

The McIntyre Porcupine Mines, Limited, during 1913 carried out an extensive plan of development and construction work on their holdings at the west end of Pearl lake. The directors and officers of the company are: Mr. Albert Freeman, New York, president; Mr. C. B. Flynn, New York, vice-president; Mr. M. P. van der Voort, Toronto, secretary-treasurer; Mr. J. P. Bickell, Toronto; Mr. H. L. Kramer, Toronto; Mr. I. J. R. Muurling, New York; Mr. R. J. Ennis, general manager.

Development work during the year consisted of 204 feet of shaft-sinking, and 3,967 feet of drifts, cross-cuts, raises and winzes; 37,667 tons of ore were mined.

The new 150-ton cyanide mill was put in operation in March and up to the end of the year treated 25,335 tons of ore. The stamp mill was used for sampling purposes during the year and treated 5,632 tons of ore. A second unit of 150 tons capacity is being added to the cyanide mill and will be in operation about September 1st, 1914. In the new unit decantation will replace the filters of the old unit.

During the year \$232,824.99 in bullion was shipped, and \$99,661.33 was spent in buildings and plant.

#### Miracle

The Porcupine Miracle Mining Company, Limited, are owners of a group of claims in Langmuir township, near the southern end of Night Hawk lake. A working shaft has been sunk to a depth of 100 feet.

The plant consists of two boilers of 40- and 20-h.p., a 12-drill compressor, a small hoist, and a small portable saw mill.

A 100-h.p. boiler, two jaw crushers, and a 60-ton Hardinge ball mill are to be taken in during the winter.

Mr. H. B. Ransome is manager, employing 20 men.

#### North Dome

The North Dome Mining Company, Limited, controlled by the Temiskaming Mining Company, ceased operations on their property on lots 3 and 4 in the first concession of Tisdale. Regarding the results of the underground development the management state that a large tonnage of low-grade ore, running between \$6 and \$7 to the ton, was indicated, and that a diamond-drill hole, put down in the previously unprospected ground near the southwest corner of the property, where the contact between the slate and porphyry is hidden from view by deep muskeg, encountered at a vertical depth of 400 feet about 60 feet of quartz, which, although giving a low average assay, showed in the core free gold easily visible to the naked eye.

#### North Thompson

Towards the end of the year an option was taken on this property, which lies between the Porcupine Crown and the Vipond mines, by the Associated Gold Mines of West Australia. A prospecting shaft is being sunk, and several diamond drills are at work on the property.

Mr. N. J. Evered is manager.

### Pearl Lake

The following is the development footage accomplished on this mine up to the end of December, 1913: Drifting, 1,166.18 feet; cross-cutting, 1,649.89 feet; raising, 168 feet; depth of main shaft, 673 feet.

### Porcupine Crown

The Porcupine Crown Mines, Limited, took over the McEnaney claim, which adjoins the Hollinger on the south, on June 10th, 1913. The McEnaney claim was developed by the Crown Reserve Mining Company, which company received 1,667,000 shares of the 2,000,000 shares of the Porcupine Crown Mines, Limited.

The officers of the company are as follows:—Lieut.-Col. John Carson, president; Mr. J. W. Gear, first vice-president; Mr. C. E. Potter, second vice-president; Mr. James Cooper, secretary and treasurer; Mr. John Reid, assistant secretary-treasurer; Mr. S. W. Cohen, general manager; Mr. M. W. Summerhayes, resident manager.

The Porcupine Crown Mines, Limited, was the second Porcupine mining company to go on a regular dividend-paying basis. On January 1st, 1914, the company began paying a dividend of twelve per cent. per annum, payable quarterly.

The development work during 1913 was as follows:—

	To 1913.	1913.	Total.
	ft.	ft.	ft.
Sinking and raising .....	738	554	1,292
Drifting . . . . .	1,402	702	2,104
Cross-cutting . . . . .	1,301	1,225	2,526
Total .....	3,441	2,481	5,922
Stopping in cubic feet .....			142,643
Cubic feet—Sump .....			2,734

In addition 2,739 feet of diamond-drilling was done. The main shaft is now down to the 400-ft. level, and a winze has been sunk from the 400 to the 500-ft. level.

During the year the following buildings were erected:—

Mill and refinery, bunk house, dry house, oil house, pipe shop, carpenter's shop, powder magazine, six small cottages for married employees, main shaft house and tramway, additions to power house for installation of a new boiler, transformer house for the installation of three new 50 k.w. transformers, addition to the cook camp. A new 15-drill compressor was installed in the power house, also a new motor for large electric hoist. The machine shop was fully equipped, and a drill sharpener was added to blacksmith's shop.

The mill was increased by the addition of 15 stamps, duplex classifier, tube mill, cyanide tanks, etc. The continuous decantation process of cyaniding the ore is used. The maximum capacity of the mill is 180 tons per day; an extraction of 96 per cent. is being made. During the year 19,754 tons, of an average value of \$20.30 per ton, were treated.



### Porcupine Lake

The Porcupine Lake Gold Mines, Limited, have continued their shaft on the shore of the lake to a depth of 275 feet on the incline, and have cut a station at that level.

The plant consists of one 60-h.p. boiler, a 4-drill compressor, and a hoist. A 15-drill electrically-driven compressor, a 55-h.p. motor, and the necessary transformers are on the ground ready to be installed.

Mr. J. F. Wenstrom is manager, employing 20 men.

### Rea

The Mines Leasing and Development Company acquired a lease on the Rea mine in May, 1913. The property was taken over by the leasing company in May, 1914, and the Porcupine Aurum Mines Company, Limited, formed.

A 10-stamp mill is in operation.

Mr. David Sloan is manager, employing 40 men.



Porcupine Lake Gold Mine

### Schumacher

Schumacher Gold Mines, Limited, started work on the Schumacher property south of Pearl lake in June.

The south cross-cut on the 100-ft. level of No. 2 shaft was continued 140 feet, where No. 2 vein was cut; 200 feet of drifting was done on this vein.

From these workings a 3-compartment shaft, 6 by 15 feet, was raised to the surface; a head frame was erected and a power plant installed. Sinking was then begun in this shaft and it had reached a depth of 175 feet at the end of the year.

The amount of drifting and cross-cutting done from June 4th to the end of the year was 705 feet; raising, other than main shaft, 18 feet. There were also 2,500 cubic feet of stations and sumps cut.

The plant consists of one 135-h.p. Jenckes boiler, one 10 by 12 double-drum Jenckes hoist, one 540 cubic-foot cross compound Ingersoll-Rand compressor, one 100-h.p. C. G. E. motor, two 50-K. V. R. transformers, and one 6 by 8 single-drum Jenckes hoist.

### Three Nations

The Three Nations Gold Mining Company, Limited, in Whitney township have sunk a shaft to a depth of 225 feet. The drifting on both levels amounts to about 800 feet, and the cross-cutting to 700 feet.

The plant consists of three 100-h.p. and one 35-h.p. boilers, a 3-drill compressor, and an 8 by 10 hoist. A 10-stamp mill has been built on the property.

Mr. J. N. Angrignon is manager, employing 40 men.



Surface Plant at Schumacher Mine



Surface Plant of Three Nations Mine

#### Alexo Nickel Mine

The Alexo Mines, Limited, on lot 1 in the third concession of Dundonald township, are mining nickeliferous pyrrhotite of a very good grade and shipping it to the Mond smelter at Coniston. The ore is teamed three-quarters of a mile and then loaded in cars on the T. & N. O. railway siding at Kilburn. The ore has been taken from a pit 75 feet deep and 60 feet long on an ore body averaging about 15 feet in width, and from a drift run 70 feet to the south from the bottom of the open pit. Drilling was done at first with hand steel, but later a 30-h.p. boiler was put in, which is used to run one drill and the hoist.

The property was located at the time of the building of the National Transcontinental railway, and before the discoveries at Porcupine, by Mr. Alex. Kelso, who was guided to the place by the attraction of the magnetic needle noted in the land surveyor's reports. It is worked by a syndicate, composed of the original owners headed by Mr. E. F. Pullen, who acts as manager. Fourteen men are employed.

#### Dane and Larder Lake Areas

##### Goldfields

The 30-stamp mill on this property was running until May, 1913, when work was suspended. The workings consist of an open pit, or glory hole, connecting with an adit level at 65 feet; considerable drifting on this level; and a shaft sunk 125 feet below the 65-foot level.

Besides the mill, the plant consists of an 8-drill compressor, two hoists, and a 25-h.p. boiler for heating purposes. Power is supplied by the company's hydro-electric plant of 750-h.p. capacity at Raven falls, thirteen miles distant. The compressor is driven by a 150-h.p. motor, and the stamps and crushers by motors of 60- and 50-h.p. respectively.

At the end of the year a contract for sinking another 100 feet was let to Mr. Hugh McMillan, of Cobalt. The company are operating 10 stamps to treat the ore obtained in sinking.

Mr. Geo. A. McKay, of Toronto, is manager, and Mr. J. F. Thornham is superintending operations.



Lucky Cross Mill



#### La Mine D'or Huronia

La Mine D'Or Huronia, Limited, operated by a Three Rivers (Que.) Company, is situated in the fifth concession of Gauthier and McVittie townships.

The present 10-stamp mill is being enlarged by the addition of five stamps and a ball mill, two 100-h.p. motors and one 30-h.p. motor, and three 75 K.V.A. transformers. Power will be supplied for the mill, the 7-drill compressor, and the hoist, by their own hydro-electric plant on Victoria creek, three-quarters of a mile distant, which is expected to develop 250 horse-power. The present 35-h.p. boiler will then be used for heating.

The underground workings consist of No. 2 cut, which is down 32 feet, and a short adit at the level of the lake.

Mr. E. H. York is manager, employing 40 men.

#### Swastika and Kirkland Lake Areas

The Swastika and the Lucky Cross mines both suspended operations during the year.



Shafthouse at Tough-Oakes Mine

#### Tough-Oakes

The Tough-Oakes Gold Mines, Limited, at Kirkland lake, which were controlled by Mr. C. A. Foster, of Haileybury, sold out during the year to an English company, the Kirkland Lake Proprietary. This company employ 110 men.

The incline shaft on No. 2 vein was continued to a depth of 210 feet, and levels opened at 100 and 200 feet. The drifting on the first level amounts to some 270 feet, and on the second level to half this amount. It is the intention of the management to have this shaft down another 100 feet, and the shaft on the No. 3 vein opened to the first level by the time power is available in the spring.

The present plant consists of a 5-stamp mill, two compressors of 140 and 200 cubic feet capacity, two 6 by 8 hoists, four boilers with a total capacity of 125-h.p., and a D.C. generator for electric lighting. The additions to the plant comprise a 250-h.p. motor, a compressor of 1,526 cubic feet capacity, a 10 by 12 hoist, and a skip of 25 cubic feet capacity. Power will be supplied by the Charlton and Englehart Power Company from their plant at Charlton.



Mr. C. A. O'Connell, manager, gives the following table of production and shipments during the years 1912 and 1913 :

Shipment	Date	Net Dry tons	Oz. per ton Silver	Oz. per ton Gold	Gross Value
A .....	Sept. 8, 1912 .....	1.892	.....	17.451	\$ 660 37
B .....	Dec. 21, 1912 .....	19.905	23.400	22.509	9,235 60
C .....	Mar. 19, 1913 .....	20.527	33.665	19.688	8,492 23
D .....	June 5, 1913 .....	30.438	37.900	23.040	13,147 10
E .....	Oct. 31, 1913 .....	28.287	67.500	24.075	14,685 90
Total .....		101.049	.....	.....	\$46,221 20

The bullion won from 1,975 tons milled in 1913 was as follows :

Bullion Bar	Date	Oz. Silver	Value Silver	Oz. Gold	Value Gold	Gross Value
			\$		\$	\$
1 } 2 }	June, 1913 .....	50.83	29 54	296.175	6,122 48	6,152 02
3	Aug. " .....	28.10	16 50	207.250	4,212 75	4,229 25
4a	Sept. " .....	43.86	26 53	280.321	5,794 75	5,821 28
5a	Nov. " .....	37.84	22 42	233.662	4,830 23	4,852 65
6a	Dec. " .....	37.60	21 57	255.038	5,272 10	5,293 67
Total .....		198.23	116 56	1,272.446	26,232 31	26,348 87

Wright-Hargraves

Work on the Wright-Hargraves claims was suspended about the end of the year by the Cartwright interests, who held them under option.

This property comprises four claims in the township of Teck at the east end of Kirkland lake.

The development work consists of two shafts, 20 and 85 feet in depth, and 110 feet of drifting on the 75-foot level.



Teck-Hughes Gold Mine, No. 1 Shaft

#### Teck-Hughes

The Teck-Hughes Gold Mines, Limited, prosecuted development work actively during the year. They have four shafts in all, varying in depth from 40 to 212 feet. No. 1 shaft is down 212 feet, and the drifts on the 200-foot level total 203 feet. Work has been discontinued in this shaft. No. 2 shaft has been put down in the southwest corner of the property to a depth of 75 feet. Drifting was commenced on the 75-foot level in the shaft early in December, and is being carried on at the rate of about 125 feet a month. Some good ore shoots have been encountered.

The plant consists of two boilers of 60 h.p., a 2-drill compressor, and a hoist. Mr. Alex. H. Smith is consulting engineer and manager.

#### Sylvanite

The Sylvanite Gold Mines, Limited, formerly the Wright and Robbins claims, adjoining the Tough-Oakes on the west, have also been acquired by the Kirkland Lake Proprietary.

Dining-room and sleeping camp have been built, and a force of 15 to 18 men were engaged during the winter in trenching. There are two prospecting shafts down to depth of 50 and 40 feet.

Mr. C. A. O'Connell is manager.

#### Burnside

The Burnside Gold Mines, Limited, whose claims adjoin the Tough-Oakes on the south in the townships of Teck and Lebel, are also controlled by the Kirkland Lake Proprietary and are under the same management.

The only work done on the Burnside claims during the winter consisted of 500 feet of diamond-drilling on the southwest corner of L. 1821. There are two shafts, with depths of 70 and 90 feet respectively; on the 75-foot level 190 feet of cross-cutting and drifting has been done.

The plant consists of two boilers, a compressor of 175 cubic feet capacity, and a small hoist.

#### Solid Silver

The Solid Silver Mines, Limited, are situated in Burt township, about 13 miles west of Kenogami Station, on the Temiskaming and Northern Ontario railway. They are reached by a wagon road six miles long from Kenogami lake. The first seven miles of the journey is made by boat. The workings consist of a shaft 100 feet deep and 75 feet of cross-cutting on the 100-foot level. The plant comprises a 60-h.p. boiler, a 6 by 8 hoist, and a portable sawmill. The mine was in operation during a portion of the year. Mr. Wm. Shovel is superintendent, and Col. Daniel B. Shepp, president.

### IV.—EASTERN ONTARIO

During 1913 Eastern Ontario continued to attract considerable attention from mining men. Possessing as it does a variety of minerals, some of which occur in large bodies of commercial importance, interest is continually sustained, and prospecting in a desultory manner is carried on almost continuously throughout the year. Occasionally new and important discoveries of mica are made, and in the non-metallics alone Eastern Ontario presents a practically virgin field for systematic, scientific prospecting.

During the year gold, talc, amber mica, magnetic iron ore, apatite, graphite, iron pyrites, feldspar, quartz, corundum and fluorite were mined and shipped.

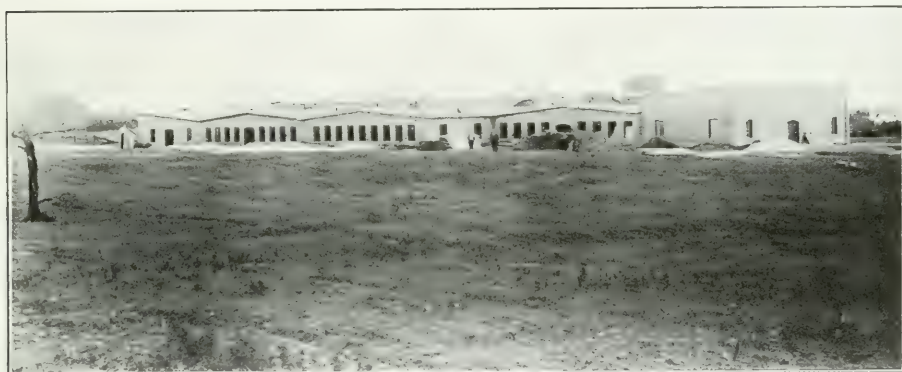
Attention was attracted some years ago to the sodalite deposits near Bancroft in Hastings county, and a small quantity was shipped for decorative purposes, but the deposits were not found to be of commercial importance. The universal agitation throughout the Province for better roads, and the gradual awakening of the boards of

trade and business men in general, to the fact that good roads are of first importance in the development of trade, have drawn attention to Eastern Ontario as a source of supply for road-making material. Trap rock or diabase, considered the most durable for macadamized roads, is found in Peterborough and Hastings counties. At Preneveau, near Havelock, a large quarry is being operated by the Ontario Rock Company. In Frontenac and Hastings counties unlimited supplies of limestone and granite are to be found.

This area has also shared in the recent development of the brick industry and its allied clay products.

Frontenac county continues to be the leading producer of feldspar. The Richardson mine in Bedford township showed an increase over 1912, and the Reynolds mine owned by the same company is proving to be a large deposit of high-grade spar.

Formerly all of the spar produced was shipped to the New Jersey and Ohio potteries, in the raw state, or as ground spar from the Genesee grinding plant near Charlotte, New York. During 1913 the Kingston Floor and Wall Tile Company was formed and a plant built in Kingston. This plant is now producing floor tile, and later on will be manufacturing the larger patterns of wall tile. It will use a considerable quantity of the local feldspar.



Plant of Frontenac Floor and Wall Tile Company, Kingston

## Iron

### Belmont

Operations at this mine, formerly known as the Ledyard, were continued during 1913 by the Buffalo Union Furnace Company. The mine is situated on the west half of lot 19, first concession of Belmont township, Peterborough county. The 3-compartment vertical shaft has been carried to a depth of 260 feet, and sinking operations were being continued on the date of inspection. The first and second levels remain the same as last report. On the third level, at 235 feet, the south drift had been extended to 125 feet and 55 feet of cross-cutting done.

The ore body appears to be widening at depth, and the grade rising. A branch line of the Central Ontario railway connects the mine with the main line at a point north of Canadian Pacific Railway Junction. The output is being shipped to the new furnace plant of the company at Port Colborne.

Mr. Frank Platto is manager of the mine, employing fifty men.

The Canada Iron Mines, Limited, own the Bessemer and Childs group of mines near L'Amable station, the Coe Hill mines at Coe Hill, and the Blairton mines near Marmora. This company have also built a concentrating plant at Trenton, to which all their ore is shipped via Central Ontario railway.

The Bessemer and Childs group comprise 3,100 acres in the townships of Mayo and Dungannon, and are connected with the main line of the Central Ontario railway by the Bessemer and Barry's Bay railway, owned and operated by the mining company.

Mr. W. J. McLaughlin, Trenton, is manager of the company.

#### Bessemer Mine

At this mine work throughout the year has been confined to development in No. 4 shaft, with stoping continued on the second level.

The first and second level drifts under Little Mullet lake have been carried to the limit and abandoned. At the fourth or 250-foot level a station was cut, and at the date of inspection the management intended to drift in the hanging to a distance of 25 feet from the shaft and at that point sink a winze to the fifth level. The ore is hoisted in a one-ton skip and is dumped directly into a No. 6 Gates gyratory crusher. A 22-inch belt, 44 feet in length, conveys the ore from the crusher to the loading bins. It was proposed to instal a magnetic clobber at the head of the belt conveyor to reject clean rock, heretofore hand picked.

The mine is in charge of Capt. Alfred Hendra, employing 100 men.

#### Childs Mine

This mine is situated about three miles northeast of the Bessemer, on lot 11 in the ninth concession of the township of Mayo. The ore body has been diamond-drilled to a depth of 300 feet.

At the date of inspection, mining by the open-pit method was being carried on at No. 1 and No. 2 pits, about 300 feet apart. The ore was loaded by hand into wooden, end-dump, train cars of the coal-mine type, capacity  $2\frac{1}{2}$  tons each, and 36-inch gauge. The loaded cars are assembled and hauled to the foot of the incline by a  $12\frac{1}{2}$ -ton dinkey locomotive, hoisted and discharged direct into a No. 5 (K) Allis-Chalmers gyratory crusher, thence to loading bins.

Thirty men are employed.

#### Rankin-Coe Mine

This prospect is situated on lot 10 in the ninth concession of the township of Mayo, and was worked under lease with option to purchase by the Canada Iron Mines, Limited. The ore body was stripped over an area 300 feet by 75 feet. The option expired on January 1st, 1913, and work was abandoned by the company.

#### Concentrating Plant

This plant is situated in the town of Trenton, on the east side of the Trent river at the point where it empties into the bay of Quinte. Its situation assures good shipping facilities by lake and rail.

The ore, crushed at the mine to  $2\frac{1}{2}$  inch, is received in standard-gauge ore cars and dumped into bins. From the bins it is drawn off by 3 roll-type feeders, and elevated to a shaking screen at the top of the mill. This screen has  $\frac{3}{4}$ -inch square openings.

The oversize from the screen goes to the mill bins, and passes through an oscillating feeder to a set of 40-inch by 15-inch Anaconda rolls. The entire crushed and fine product is discharged into a trommel 12 feet in length by 4 feet in diameter, making four sizes and oversize. The fines go direct to the magnetic separator and the coarse sizes to Ball-Norton drum separators. The middlings are recrushed and returned to the separator.

Up to February, 1914, only one unit of the concentrator was in operation on a mixture of Bessemer and Childs ores, the fines being treated by the wet method on a Grondal machine. It was found that better results could be obtained by treating the Childs ore in a separate unit, and for this reason a second unit will be installed in a



short time. Each unit will have a capacity of 300 tons of concentrates per day. All the crude ore through the  $\frac{3}{4}$ -inch screen will be passed through a drier and practically freed from moisture. The coarse sizes will be treated on single-drum Ball-Norton magnetic separators, the fines going to a Ball-Norton belt type machine. Power is purchased from the Trenton Electric Company.

#### Orton

No work was done at this mine during 1913. Ore for experimental purposes was shipped to Belleville and Deseronto, from stock produced in 1912. The mine is owned by J. W. Evans and associates.

#### Gold

##### Cordova Mine

During the first half of the year this mine was worked by P. Kirkegaard and associates. For the first three months 60 men were employed, but the force was gradually reduced and the plant closed down in August.

Stoping was continued on the fourth and fifth levels of No. 3 shaft, and No. 1 shaft was dewatered to the second level. This shaft was square set to the first level and a skip track was put in, on the west side. Considerable broken ore was found in the stopes at the first level, and stoping commenced in the east drift on the second level. Sufficient ore was raised to keep 30 stamps dropping, and it is the intention of the management to connect No. 1 and No. 3 shafts at the 500-foot level.

##### Golden Fleece

This mine, situated on the west half of lot 24 and lot 25 in the sixth concession of the township of Kaladar, is owned by the Adelaide Mining Company of Baltimore, Maryland, and is operated under lease with option to purchase by the A. B. P. Mining Company, Limited.

On the date of inspection 15 men were employed. Underground development consists of a shaft 85 feet in depth, with a drift at the 65-ft. level running 75 feet to the north, and 45 feet of cross-cutting. This shaft had been abandoned and work was confined to an open cut about 75 feet south of the mill.

The plant consists of two boilers, one 60-h.p. and one 50-h.p., a straight line air compressor with a capacity of 300 cubic feet, two hoists, and a 25-h.p. mill engine.

A 10-stamp mill was operated intermittently, and during the summer the plant closed down.

The officers of the company are:—Mr. A. B. Potter, president, Flinton, Ont.; Mr. J. L. Potter, treasurer, Flinton, Ont.; Mr. E. V. McMillan, secretary, Toronto.

##### Ore Chimney

The Ore Chimney Mining Company own lots 34, 35 and 36 in the first concession of the township of Barrie. The mine was inspected on December 17th, 1913, and on that date all work was being carried on by Caldwell Bros., contractors. This firm had a contract to sink the shaft to the 375-ft. level and drift 1,000 feet. Work was being carried on vigorously.

On the date of inspection the shaft had been carried to a depth of 160 feet, where the second level station was being cut. The shaft was timbered to the bottom with 8 by 8-inch posts and plates and 6 by 8-inch dividers.

During the summer a new frame boarding-house and storeroom, also a new dry house, had been constructed. The plant remained the same as last report, with addition of a new 100-h.p. boiler and a 12 by 15-inch hoist.

No ore had been shipped from the property.

The officers of the company are:—Mr. A. E. Fletcher, president, Hamilton; Mr. Chas. Narraway, secretary, Hamilton.

## Iron Pyrites

### Sulphide

The Nichols Chemical Company continued to operate their pyrites mine on lot 23, in the eleventh and twelfth concessions of the township of Hungerford. The company also purchased ore from operators in other parts of the county.

Practically no new work was done in the mine. Stoping was continued on the first and second levels on the north vein, the ore being trammed from the fourth level.

No. 1 shaft, 300 feet in depth, has been abandoned.

No. 2 shaft has been carried to a depth of 575 feet, with six levels. The electric thawing apparatus, installed in an abandoned drift on the fourth level, has given good satisfaction, and is considered a safe and practical device.

In the crusher plant a 36 by 16-inch Allis-Chalmers crusher was installed to follow the No. 3 McCully, replacing the set of 24 by 14-inch rolls now used to finish the product.

A new drier, 40 feet in length by 5 feet in diameter, has been installed in the crushing plant.

The dust in the crushing plant has been materially reduced by the No. 5 American blower fan, capacity 2,040 cubic feet per minute, installed in April, 1913.

No change was made in the acid plant during the year.

Mr. W. H. DuBlois is in charge of the works, employing 130 men.

### Queensboro

The Canadian Sulphur Ore Company mine, on the north half of lot 9, in the ninth concession of Madoc township, has been in continuous operation during the year.

The Bay of Quinte railway branch to the mine was completed.

Shafts Nos. 1 and 2 were abandoned and work confined to No. 3, which has been sunk to a depth of 150 feet. The west drift on the first level was extended, and a raise put through to No. 3 open pit. A drift is being run to connect No. 3 and No. 4 open pits.

The shaft has been fitted with guides and a cage installed, and at the time of inspection preparations were under way to instal a new electric hoist to replace the small air-driven hoist then in use.

Mr. W. Coleman is superintendent, employing 50 men.

The officers of the company are:—Mr. A. Longwell, president; Mr. Geo. H. Gillespie, vice-president; Mr. A. B. Willmott, manager.

### Craig

Operations were resumed at this mine during the spring of 1913, by the Sulphide Chemical Company of Toronto. The mine is situated in the eleventh concession of the township of Hungerford, near the village of Sulphide.

A new head frame and ore pockets were constructed, and the mine dewatered and sampled. The shaft has a depth of 250 feet, with the first level at 90 feet and the second level at 180 feet. A considerable quantity of ore was found in the first level west stope, and this was hoisted and shipped. A raise was run from the second level east stope to surface.

Mr. Richard O'Connor was superintendent, employing 15 men. Work was discontinued in November, 1913.

### Talc

#### Henderson

This mine is situated on lot 14, in the fourteenth concession of Huntington township, near the village of Madoc. It is operated under lease by Messrs. Cross and Wellington. Practically all the output is delivered direct to the grinding plant of Messrs. Geo. H. Gillespie and Company.

Owing to the fall of ground in March, 1913, No. 2 shaft was abandoned, and work during the year was confined to No. 1 shaft. The caved ground near No. 2 shaft was stripped and worked as an open pit, a large quantity of ore being recovered in this manner. No. 1 shaft is now 250 feet deep, and preparations are being made to work the mine on the caving system.

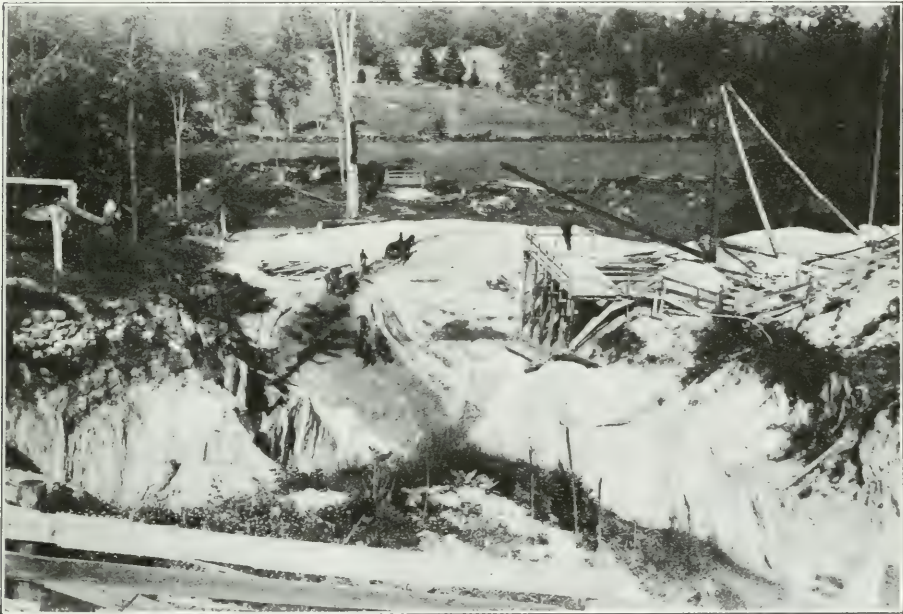
A new compressor, 2-drill capacity, was installed in December, 1913. Mr. Steven Wellington is in charge, employing 25 men.

#### Gillespie Mill

The talc grinding plant, owned by Messrs. Geo. H. Gillespie and Company, built near the Grand Trunk railway station at Madoc, was operated continuously during the year 1913. Two tube mills were added to the plant and the bag house remodelled during the summer.

Seymour electric power at 220 volts is used to operate the machinery. The crude talc is purchased from Messrs. Cross and Wellington, and hauled by teams from the mine to the mill.

Mr. George H. Gillespie is manager, employing 20 men.



Henderson Talc Mine, Madoc, Ont.

#### Canadian Talc and Silica Company

The mine and grinding plant of this company are situated near Eldorado station on the Central Ontario railway.

Two incline shafts have been sunk. Stoping was continued on the first level of No. 1 shaft, which at date of inspection was 90 feet deep.

No. 2 shaft was 130 feet deep and connected at the 90-foot level with No. 1 shaft by a drift 200 feet in length.

The mill is equipped with a complete plant for grinding and bolting talc.

Mr. R. M. Phillips is in charge of the property, employing 25 men.

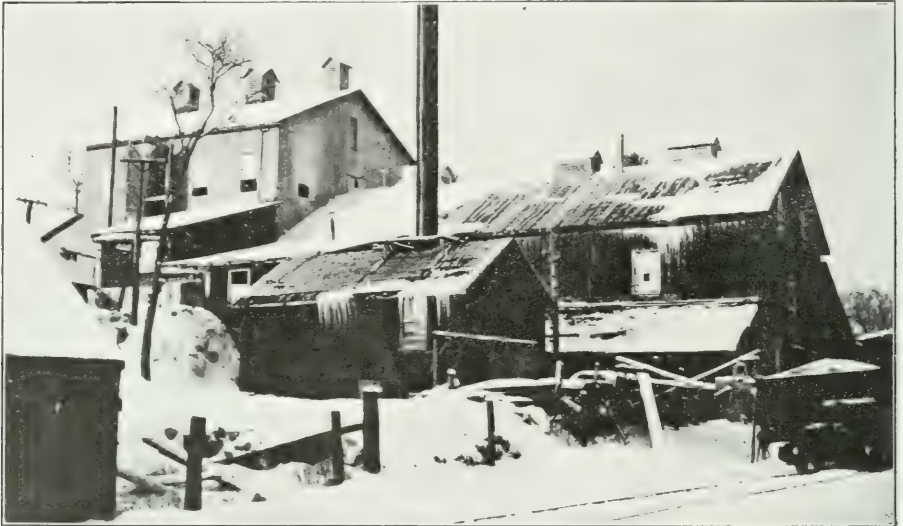
The officers of the Company are:—Mr. H. B. Hungerford, president, Chicago; Mr. David Plant, vice-president and secretary, do.; Mr. M. H. Orde, treasurer, do. Head office, Room 100, McKinnon Building, Toronto.



**Connolly**

This mine adjoins the Henderson mine to the east, and is owned by the Hungerford syndicate.

A 2-compartment vertical shaft was sunk to a depth of 70 feet, and 75 feet of drifting done on this level. At the date of inspection, Mr. L. J. Browning was in charge, and preparations were being made to instal a complete plant, electrically driven, power to be purchased from the Seymour company. Work was discontinued in the spring of 1913.



Talc Grinding Mill at Madoc

**Lead****Frontenac**

This mine, situated in the township of Loughboro, near Perth Road, and owned by the North American Smelting Company, Kingston, was closed most of the year, while alterations and experiments were being carried on in the concentrating plant. Shafts Nos. 1 and 2 were not dewatered. At No. 3 shaft the raise in the north drift was pushed through to surface.

The plant at the mine remains as last reported. In the mill, the shaking screens were replaced by trommels, and the jig capacity enlarged.

Mr. C. E. Schwartz was in charge of the mine, employing 40 men.

**North American Smelter**

The North American Smelting Company operated their lead smelter at Kingston up to November 1st, 1913. Some concentrates from their mine at Perth Road were smelted, but most of the ore treated was purchased in British Columbia.

The blast furnace was rebuilt and new hoods installed on the open hearths, and other changes made to reduce the danger to employees from lead poisoning.

Mr. W. M. Weigel, Kingston, was manager of the company during 1913.

**Buffalo and Ontario Smelter**

The Buffalo and Ontario Smelting and Refining Company continued operations during the year.

The officers of the company are:—Mr. George Wager, president, Buffalo, N.Y.; Mr. J. J. Gilchrist, superintendent, Kingston; Mr. Geo. H. Fullerton, treasurer, Kingston.



Work during the year was confined to carrying on experiments in the smelting and refining of low-grade silver, cobalt ores, up to the point of making the mixed oxides. The year's work has been confined to experimentation. A few small shipments of cobalt-nickel speiss and mixed oxides were made.

The material for experiments consisted of Nipissing residues, and a small quantity of high-grade cobalt vein matter.

### Feldspar

#### Richardson

As anticipated in last year's report, the output of this mine was considerably increased in 1913. An incline skip track was built and a cobbing house erected, doing away with the old method of hand sorting in the pit.

Stripping to uncover new ground between the old pit and Desert lake was commenced in the fall of 1913, and abandoned when the overburden was found to be of considerable depth.

Fifty men are employed, under foreman S. Hunter.

Mr. H. W. Richardson, Kingston, is president and general manager of the Kingston Feldspar and Mining Company, which owns the Richardson and Reynolds mines.

#### Reynolds

The Reynolds mine, situated on lot 1, in the thirteenth concession of Portland township, was operated during the year 1913, and several thousand tons of high-grade spar were mined. During the open winter of 1912 and 1913 no ore was shipped. In 1913 the lakes were frozen over early in the season, and the stock pile was hauled to Verona and shipped in box cars to the Ohio potteries. It is anticipated by the management that this mine will have a greater production in 1914, owing to operations on a larger scale being started in the spring.

### Mica

With the exception of two mines, the production of mica in Eastern Ontario continues to come from small prospects worked only at intervals. A good market prevailed during 1913 for all sizes and for the different varieties. Interest revived during the year, and considerable prospecting was done in Bedford, Loughborough and Burgess townships.

#### Lacey

During 1913 this mine, situated on lot 11, in the seventh concession of Loughboro, sustained its previous record as the largest producer of mica in the Province. It is owned and operated by the Loughboro Mining Company.

The main shaft is 185 feet deep, work during the summer months being confined to the open cut near the main shaft.

Mr. George W. McNaughton is manager, employing 30 men.

#### Taggart

This mine, owned by Messrs. Kent Bros. and Mr. J. M. Stoness, of Kingston, is situated on the west shore of Bob's lake on lot 30 in the sixth concession of Bedford township. It was discovered in 1898 by Thomas Taggart, who opened several shallow pits. The present owners purchased the property in 1903, and since then it has been a steady producer. The mica occurs in a series of parallel veins about 15 feet apart, and having an average width of 3 feet.

The open pits are carried about 8 feet in width.

No. 1 or Taggart pit measures 60 feet in length by 55 feet deep.

No. 2 or King pit measures 50 feet in length by 70 feet deep.

No. 3 or Klondike pit measures 60 feet in length by 60 feet deep.

The mica produced is shipped to Messrs. Kent Bros.' trimming works at Kingston.

#### Scott

In the summer of 1913 Messrs. Scott Bros., of Bedford Mills, discovered mica on lot 7 in the ninth concession of Bedford township, about one-half mile from the west end of Devil lake on the south shore. The prospect opened up well and in December, 1913, it was sold to Messrs. Stoness, Anglin and Gilbert, of Kingston, who have erected on the property a blacksmith shop, boarding camp and mica house. On the date of inspection preparations were being made to instal a steam plant.

#### Tett Bros.

This mine is situated on lot 4 in the tenth concession, Bedford township, and was formerly a large and steady producer of high-grade mica. During 1913 it was operated under lease by Messrs. S. C. and W. E. Ennis, of Kingston. Work was confined to prospecting the property for new veins.

#### Trimming Works

The following firms are engaged in trimming and thin-splitting mica in Ottawa: General Electric Company, Laurentide Mica Company, Messrs. Eugene Munsell and Company, Mr. S. O. Filion, Mr. R. Blackburn, Mr. N. Holland, Wallingford Mining and Mica Company; and in Kingston, Messrs. Kent Bros.



Mill of the Tonkin-DuPont Graphite Company at Wilberforce

#### Graphite

##### Black Donald

The Black Donald Graphite Company, owning and operating the above mine, were the main producers of graphite in the Province during 1913. The mine and grinding plant are situated about fifteen miles from Calabogie in Renfrew county, the property comprising lots 17 to 20 in the first, second and third concessions of Brougham township.

The mine is operated during the summer months, when sufficient crude ore is taken out to run the mill during the year. Stopping was continued in the east end of the pit.

Electric power for operating the mine and mill machinery is generated at Power House rapids on the Madawaska river. This power plant is owned by the Ontario

Graphite Company and operated by the Black Donald Company; 400 horse-power are developed.

The officers of the company are: Mr. Geo. Bunting, Kansas City, President; Mr. R. F. Bunting, Calabogie, manager; Mr. J. A. Snead, Calabogie, secretary-treasurer.

Thirty men are employed, under Superintendent J. G. Patno.

#### **Tonkin-DuPont**

This mine is located on lots 34 and 35 in the sixteenth concession of Monmouth township. Prospecting by core drill was continued during the summer of 1913, and the mill was supplied with ore from the company's mine near Maynooth, shipments being made via Central Ontario railway and Irondale, Bancroft and Ottawa railway.

The Tonkin process of concentration is used in the mill.

The officers of the company are: Mr. J. J. Tonkin, New York, president; Mr. H. G. Tonkin, Wilberforce, manager; Mr. M. DuPont, Atlantic City, treasurer,

#### **New York Graphite Company**

This company continued to work their property on lots 9 to 11 in the twenty-second concession, Cardiff township.

A large modern mill was built in the spring of 1913.

Mr. J. W. Brewer is manager, and at date of inspection 35 men were employed.

#### **Fluorspar**

The fluorspar deposit, formerly worked by Messrs. Gillespie and Wellington, and located about two miles southwest of Madoc village, was operated for a few months in 1913 by Mr. C. Bowman. The old workings were unwatered and the shaft sunk to a depth of 50 feet.

#### **Silver Refinery**

##### **Deloro Mining and Reduction Company**

This company continued to operate their plant at Deloro during 1913. The branch line from Marmora station on the Central Ontario railway to the smelter was completed during the summer, doing away with the three-mile wagon haul and facilitating shipping and unloading material.

The schedule of freight rates to Marmora and the tariff of ore prices paid by the company is given in the 1912 Report of the Bureau of Mines.

Mr. S. B. Wright is manager, employing 130 men.

#### **Electric Smelting Plant**

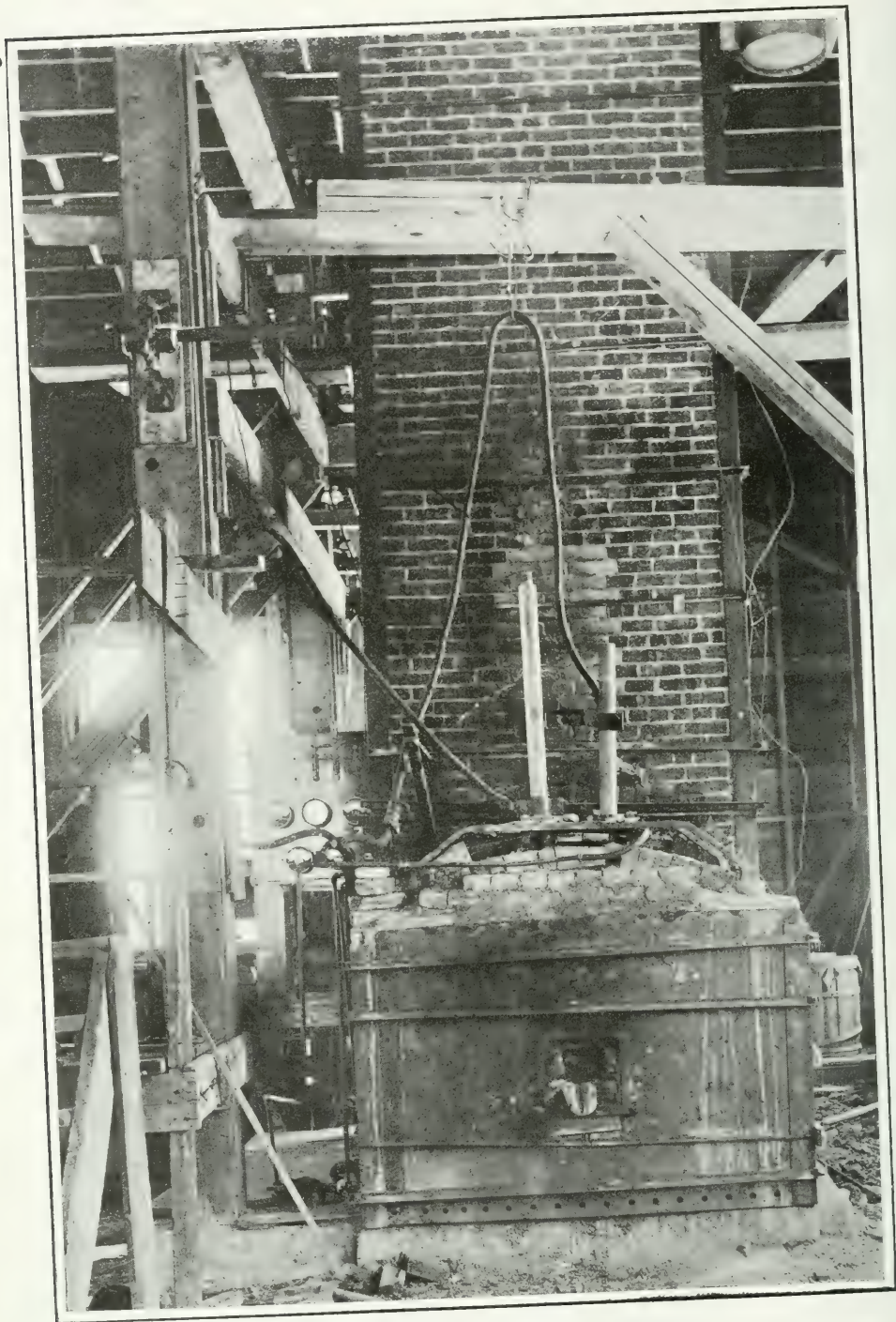
Following is a description of a one-ton direct smelting electric furnace plant operated by the Tivani Electric Steel Company, Limited, of Belleville:

The plant consists of two 75-K.W. transformers operating at 90 volts, and supplying power to a 1-ton furnace and the following apparatus: one 7 by 9 inch Dodge rock crusher, one 10-h.p. motor, an elevator to convey the crushed material to the charging floor of the furnace, a complete switchboard with the necessary ammeters, volt meters, oil break switch with contact breaker, etc. The dimensions of the furnace are as follows:

The outside dimensions, including the pre-heater, are 20 feet 9 inches high, by 6 feet, by 4 feet, the furnace hearth being 3 feet 7½ inches by 5 feet 4 inches. The interior of the hearth is 2 feet by 3 feet, and 6 feet deep.

The furnace lining consists of fire brick; magnesite brick and ground magnesite rammed for the sides and bottom, constituting the interior lining. The electrode connections are water-jacketted, and copper pipes half an inch interior diameter, which convey the cooling water to the electrode holders, and the electrode connections, also carry the current.





Electric Furnace, Tivani Steel Company, Belleville



The pre-heater consists of two 14-inch wrought iron pipes eight feet long, supported on four firebrick cylinders, each being 12 inches deep and having a slope increasing regularly in diameter from 14 to 18 inches to allow the charge to slide easily down the heated portion of the pre-heater. These pre-heater pipes are enclosed in the pre-heater stack, which has firebrick linings, and baffle plates with openings arranged in such a manner that the heated gases circulate about the pre-heater pipes.

The furnace is operated on a two-phase current, the transformers being connected by what is known as the Scot connection.

The electrodes are three inches in diameter, threaded so that they can pass down continuously, and are used up entirely, there being practically no loss from short ends. Acheson graphite electrodes are used and pass through water-jacketted electrode holders, and are raised and lowered by levers connected with wrought iron clamps operated by right and left thread screws; these can be raised and lowered at will, one turn of the screw being sufficient to release the clamp in order to take a fresh grip on the electrode when necessary during the operation of the furnace.

The operation of the furnace is as follows: A general return electrode built into the bottom of the furnace is water-jacketted, and an auxiliary electrode is placed near the bottom of the chute of the pre-heater. This can be used when required to assist in melting down the charge as it comes from the pre-heater. By cutting off the currents supplying this electrode the charge is held back during the refining of the charge in the hearth. All the gases from the furnace are utilized in pre-heating and partially reducing the ore, and after passing through the charge they are brought down again mixed with air and burnt round the fire brick cylinders which support the pre-heater pipes. The furnace is charged from the upper floor into the pre-heater. The charge consists of iron ore, limestone and charcoal, crushed to pass through a 1-inch mesh. The charge comes down to the hearth of the furnace, where it is smelted, the furnace working continuously until the hearth is full of metal, the slag being tapped off as required from time to time. When there is a sufficient quantity of metal the charge is held back, and the metal is refined, and when ready is tapped into the moulds for ingots or bars for forging into tools. All grades of carbon steel can be made by regulating the amount of carbon in the form of charcoal mixed in the charge. If the carbon has burnt away too quickly, and there is not sufficient carbon in the metal, this can be remedied before tapping the furnace by addition of charcoal or pig iron. If the carbon is too high, it can be lowered by the addition of low-carbon scrap.

The plant was in operation for about two months, and demonstrated that steel can be made in this manner directly from titaniferous ore containing 7.5 per cent. of titanium. A quantity of high carbon steel was made, the ingots being perfectly sound and free from blow-holes. The company intend to erect a 3-ton furnace during the summer, with a view to making high carbon tool steel and steel castings, and will use the same ore from the Orton mine. The analysis of this ore is as follows:

Iron . . . . .	50.12 per cent.
Titanium . . . . .	7.5 per cent.
Vanadium . . . . .	0.11 per cent.
Nickel . . . . .	0.34 per cent.
Sulphur . . . . .	Trace
Phosphorus . . . . .	0.004 per cent.

The process used is known as the Evans-Stansfield process, the furnace having been designed by J. W. Evans and Dr. Stansfield. Patents have been granted on the furnace, on the process, and on the steel products, in both the United States and Canada, and application is now being made for the British and European patents.

## Blast Furnace

### Standard Iron Company

This company operated their plant at Deseronto up to November 1st, 1913, and closed down to rebuild the blast furnace. Operations will be resumed in March, 1914.

In the interval the whole plant has been repaired, and the furnace practically rebuilt and enlarged. Ore is brought from the Michigan mines, and a high-grade charcoal pig manufactured.

The officers of the company are: Mr. R. J. Mercur, president, Montreal; Mr. S. F. Belknap, secretary-treasurer, Montreal; Mr. R. H. Watson, manager, Deseronto.

When in operation the plant employed 65 men.



Parry Sound Plant of the Standard Iron Company, Limited

## Marble

### Ontario Quarries

The Ontario Marble Quarries, Limited, continued to operate their quarries during 1913. The siding to No. 3 quarry has been completed and will be extended to the sawing plant and will connect the three quarries with the main line of the Central Ontario railway, about two miles south of Bancroft.

No. 1 quarry, on lots 28 to 30 in the tenth concession of the township of Duncannon, has an excavation about 100 feet long, 60 feet wide, by 25 feet at the deepest point. The general strike of the belt is north 70 degrees east, in which direction the deposit has been proved by test pits for a distance of 1,000 feet.

No. 2 quarry is located about a quarter of a mile west of No. 1, and the product differs from No. 1 in colour only. In this deposit the marble is found in a variety of colours—pink, white and dark green.

No 3 quarry is situated close to the railway. The marble here is of pure white variety.

The rock is cut by steam-driven channelling machines, and run direct to the gang-saws on tram cars. There are four gang-saws, each containing about forty blades, which can be placed to cut any size.

Mr. Thomas Morrison is in charge of the property, employing 50 men.

### Limestone Quarries

#### Lehigh

At the Lehigh plant of the Canada Cement Company, situated at Point Anne, about six miles east of Belleville, limestone is being quarried for use in the manufacture of cement. A sample of this rock shows the following composition:

	Per cent.
Silica . . . . .	1.64
Ferric oxide . . . . .	.53
Alumina . . . . .	.21
Lime . . . . .	54.06
Magnesia . . . . .	.55
CO <sub>2</sub> . . . . .	42.90
SO <sub>3</sub> . . . . .	.40

The rock is loaded into 5-ton cars by a 60-ton Marion shovel, and dumped direct into the large gyratory crusher recently installed near the cement plant. About six acres have been worked out, to an average depth of 20 feet.

Mr. H. L. Shock is manager, employing 35 men in the quarry.

#### Point Anne

Point Anne Quarries, Limited, considerably increased their output of limestone during 1913.

The company ship crushed stone, rubble, and crib filling. Shipments are made in the company's fleet of boats, and all rail shipments via Canadian Northern, which runs through the north end of the property. The rock is loaded at the quarry by a model 60 Marion steam shovel into cars holding six cubic yards, and hauled by trolley to the crushing plant and bins on the lake shore. This trolley line runs from the Canadian Northern railway line, through the quarry to the loading bins on the shore, a distance of one and one-half miles.

The officers of the company are: Mr. M. J. Haney, president; Mr. J. H. M. Stewart, manager; Mr. A. G. Bennett, superintendent.

Forty men are employed.

#### Britnell and Company

On part of lots A and B in the sixth concession of the township of Somerville, Victoria county, Britnell and Company operate a sandstone quarry, employing 40 men.

The plant consists of two stiff-leg derricks, two double-drum hoists, one 40-h.p. locomotive boiler, one 35-h.p. crusher engine, and one No. 3 Gates crusher.

The company ships rubble, crushed and dimension building stone.

Mr. William Britnell, Toronto, is president, and Mr. Ben. Weaver superintendent of the quarry.

**Ontario Rock Company, Limited**

During 1913 this company continued operations in their trap rock quarry at Preneveau, near Havelock, in the township of Belmont. All their product was crushed to one inch and under, and shipped to Toronto, for use in road building, for which purpose it is well suited by reason of its extreme toughness.

The plant consists of: one 150-h.p. locomotive boiler, one 100-h.p. return tubular boiler, one 200-h.p. mill engine, one No. 5 Austin gyratory crusher, one 36 by 24 inch Farrel crusher, two 36 by 24 inch Simons disc crushers, three revolving screens.

Mr. Alex. Longwell is president, and Mr. George Reyner superintendent, employing 40 men.

**Canada Lime Company**

At Coboconk village in Haliburton county the Canada Lime Company are quarrying limestone for use in the manufacture of lime. They have three kilns in operation, two producing ten tons of lime each per 24 hours, and one smaller one, producing six tons per 24 hours.

The plant consists of a double-drum Beatty hoist and one stiff-leg derrick.

The head office of the company is at 34 Yonge Street Toronto. Mr. R. J. Christie is president, and Mr. James Ballantyne superintendent, employing 15 men.

**Toronto Brick Company**

Near the quarry of the Canada Lime Company at Coboconk village the Toronto Brick Company are quarrying limestone for use in the manufacture of lime. Two kilns are in operation.

The head office of the company is at 64 Wellington street, Toronto. Mr. F. B. Allen is secretary, and Mr. C. M. Callan superintendent, employing 12 men.

**Hastings Quarry**

On lot 11 in the thirteenth concession of Hungerford township, near Actinolite, Hastings Quarries, Limited, operated their limestone quarry during the summer months.

The plant consists of a 100-h.p. marine boiler, one 75-h.p. mill engine, two Champion jaw crushers, Nos. 4 and 5; one revolving screen, 18 feet in length by 50 inches in diameter.

A 5-pocket storage bin of 400 tons capacity has been erected.

Mr. John Grant is manager, employing at the date of inspection 20 men.

**Quinlan and Robertson**

On lot 10 in the ninth concession of Huntington township, near the village of Crookston, on the Madoc branch of the Grand Trunk railway, Messrs. Quinlan and Robertson erected a crushing plant and storage bins, for grinding the refuse limestone from operations carried on some years ago. At that time only dimension stone was shipped, and several years of quarrying left a large amount of waste rock.

One No. 4 Gates and one No. 5 McCulla crusher were installed, with a screening plant and storage pockets.

Mr. W. E. Tummon is in charge, employing 15 men.

**Tweed Quarries**

On part of lots 15 and 16 in the eleventh concession of Hungerford township, Tweed Quarries, Limited, opened up a granite quarry during the summer of 1913. A siding was built from the Toronto-Ottawa line of the Canadian Pacific railway and storage bins erected.

The officers of the company are: Mr. L. M. Dwyer, president, Tweed; Mr. J. Marchand, secretary, Tweed; Mr. James Pearson, manager.

At the date of inspection 40 men were employed, chiefly in construction work.



#### Kingston Quarry

In the city limits of Kingston several small limestone quarries were worked intermittently during 1913.

Henry MacRow operated the Montreal Street quarry under lease from the city. The plant consisted of two Climax crushers, and two revolving screens, driven by three Sawyer-Massey threshing engines. The crushed stone was sold to the city for street building.

Twenty men were employed during the summer months.

#### Delta Lime Company

On lot 27, in the eighth concession of the township of Bastard, the Delta Lime Company quarry crystalline limestone for use in the manufacture of lime. The product is hauled to Delta village, where one kiln was in operation during the summer months. The kiln has a capacity of 150 bushels of white lime per 24 hours.

Mr. Omar Brown is manager.

#### Robillard's Quarry

On lots 22 and 23 in the first concession of Gloucester township, about two and one-half miles east of Ottawa, Mr. B. E. Robillard quarried limestone during 1913. Dimension stone for building purposes and white lime are shipped, chiefly to the trade in Ottawa.

Two kilns, with a capacity of 700 bushels per day, were in operation on the date of inspection.

Thirty men are employed, under the supervision of Mr. Robillard.

#### Gosselin's Quarry

A short distance east of Messrs. Robillard's quarry, in Gloucester township, Mr. C. Gosselin has opened up a quarry in Trenton limestone, and during the summer of 1913 employed 10 men in getting out dimension stone for the building trade.

#### Eganville Quarry

In the township of Grattan, a short distance east of the village of Eganville, the Standard Chemical Iron and Lumber Company operated their limestone quarry for use in the manufacture of lime.

Two kilns were in operation, with a combined capacity of 900 bushels of white lime per day.

Mr. A. B. Arveson is manager, employing 35 men.

#### York Sand and Gravel Company

About one and one-half miles east of York, near the main line of the Grand Trunk railway, the York Sand and Gravel Company are excavating sand and gravel for use in the building trade.

The plant consists of one Brown locomotive crane and one Beatty travelling derrick, with a capacity of 15 tons. A screening plant separates the sand and gravel, and both products are loaded into cars for shipment to the trade in Toronto.

Mr. C. S. Richards is manager, employing 25 men.

#### Excavations for Clay

##### Don Valley

At the Don Valley Brick Works, situated in the Don Valley, Toronto, sand, clay and shale are quarried for use in the manufacture of brick. The circular shale pit, about 200 feet in diameter, has now reached a depth of 65 feet, and the clay above the shale is excavated by two steam shovels. The loaded cars are lowered by gravity trams to the brick plant.

Mr. Robert Davies owns the plant. Mr. William Burgess is superintendent, employing 45 men in the clay and shale pits.

The excavations of the following companies, engaged in the manufacture of brick in Toronto and vicinity, have been inspected during the year:

Bell Bros., Greenwood Avenue.

John Price, Greenwood Avenue.

Prices, Limited, Greenwood Avenue.

A. H. Wagstaff, 362 Greenwood Avenue.

Standard Brick Company, Limited,

Sun Brick Company, Don Valley.

532 Greenwood Avenue.

Port Credit Brick Company, Port Credit.

John Logan, Greenwood Avenue.

John Pears, Eglinton Avenue.

## V.—SOUTHWESTERN ONTARIO

For inspection purposes, southwestern Ontario comprises all that part of Ontario south of a line drawn from Toronto to Key Harbor on Georgian Bay. The industries in this area, which are subject to the provisions of the Mining Act, include silver smelting plants, blast furnaces, gypsum mines, quarries, excavations in brick yards, sand and gravel pits and lime kilns.

The mining of gypsum in the valley of the Grand river has been carried on for many years, and each year shows an increased demand for gypsum products.

The quarries in this part of Ontario are growing in importance yearly, while the production of clay and shale for use in the manufacture of brick and allied products has almost doubled in recent years.

Attention was directed in the Report of the Bureau of Mines, 1913, to the carelessness shown in the operation of their works by quarry owners and brick manufacturers. The warning there given needs to be repeated. A careful study of the Accident list for 1913 will show that in nearly every instance the accidents in quarries and clay excavations during the year could have been avoided by careful supervision on the part of foremen in charge. In many investigations it has been brought out that even ordinary precautions were neglected and the men left to their own resources. Foreigners who understand English fairly well often do not thoroughly comprehend orders, and for that reason it is not sufficient for a foreman to give an order or warning—it is his duty to see that it is understood and carried out. There is still a great deal of carelessness shown in the handling of dynamite by quarrymen. This is due generally to ignorance of its properties, and of the numerous causes which result in premature explosions.

### Silver Refineries

#### Coniagas Reduction Company

This company continued to operate its refinery at Thorold for the treatment of the Coniagas ore and custom ores from the Cobalt camp.

The tariff of prices paid for ores is given in the 1913 Report of the Bureau of Mines.

Refined silver and arsenic are produced, also the oxides of cobalt and nickel.

Mr. R. L. Peek is superintendent.

#### Canada Refining and Smelting Company

This plant, located within the town limits of Orillia on the Grand Trunk railway, was built in the fall of 1910, to treat Cobalt ores, and smelting operations were started in February, 1911. It operated continuously till January, 1913, when part of the plant was destroyed by fire. It was rebuilt in the fall of 1913, and on the date of inspection in February, 1914, was ready for operation. The plant has been reconstructed and several changes made to meet new conditions and requirements. An 80-foot rotary roaster replaces the hand-rabbed furnace formerly in use. A 60 by 60-foot bag house has been constructed for the crude arsenic, and 30 by 30-foot for the refined product.

Electric power purchased from the town of Orillia is used throughout the plant.

The officers are: President, Mr. H. T. Smith, Providence; secretary-treasurer, Mr. A. E. Stevens, Providence; manager, Mr. Charles Holding, Orillia; superintendent, Mr. E. A. Gethardt, Orillia.

### Blast Furnaces

The Steel Company of Canada continued to operate their furnaces at Hamilton on an enlarged scale during the year. This company is an amalgamation of the Hamilton Steel and Iron Company with The Canada Bolt and Nut Company, Canada Screw Company, Dominion Wire Manufacturing Company, and the Montreal Rolling Mills Company.

The head office is in Hamilton, Mr. R. Hobson being president and Mr. H. H. Champ treasurer.

The company operate two blast furnaces and an open-hearth plant. The officials of this company deserve to be commended for the efficient safety and first aid organization arranged for their employees. Other furnace companies, though operating on a smaller scale, would do well to study the plan in force at this plant, and similar results could easily be attained.

### Midland

The Canada Iron Corporation had two furnaces in blast and employed about 175 men when in operation. In the latter part of the year their plant was closed to effect a financial rearrangement.

Mr. A. C. Adams is manager.

### Port Colborne

The Canadian Furnace Company began operations in September, 1913, at their new plant, Port Colborne, for the manufacture of pig iron. The plant is situated at the junction of the Welland canal and Lake Erie, with a frontage of 2,200 feet on the canal, which will all be converted into dockage as soon as improvements can be carried out.

Ore is brought from Lake Superior points and from the company's mine at Belmont in Hastings county.

The capital stock of the Canadian Furnace Company is owned by the Buffalo Union Furnace Company, Buffalo, N.Y., and the plant is being operated by them to supply the Canadian market.

The whole plant is of modern construction in every respect.

In the storage bins, there is sufficient capacity to store about 250,000 tons of ore and 100,000 tons of limestone for use, between navigation periods. The furnace is 80 feet high, 13½ feet in diameter at the hearth, 19½ feet in diameter at the bosh, and 13½ feet in diameter at the stock line. Air is supplied through ten tuyeres.

The bosh and hearth are fitted with 119 water-cooled bronze plates.

At the top of the furnace the charging apparatus is manufactured under the A. G. McKee patent, a feature of which is the receiving hopper, which is conical in form, resting on ball bearings supported on top of the gas seal.

The cast house is a steel structure 200 feet long from the centre line of the furnace, and 65 feet wide.

Later on the company intend to instal a pig-casting machine for the manufacture of chill cast basic iron. By this process the iron is tapped from the furnace into a large ladle, where it is thoroughly mixed, and then poured into iron moulds carried on an endless belt. Contact with the sand is avoided and perfect uniformity of composition assured.

The officers of the company are: president, Mr. Frank B. Baird; vice-presidents, Mr. Harry Yates and Mr. C. C. Collins; secretary, Mr. R. F. Schelling.

The manager is Mr. B. Marron, employing 175 men.

### Parry Sound

At Parry Sound, the Standard Iron Company erected a modern furnace plant for the manufacture of charcoal pig iron, and began operations in July 1913. Charcoal is purchased from the Canada Chemical Company whose plant is near the blast furnace.

The plant at Parry Sound consists of one modern type blast furnace, three Robb boilers, 200 h.p. each, one Fraser and Chalmers blower, capacity 12,000 cubic feet of air per minute, two Brown hoists, one Otis elevator hoist, ore dock and travelling cranes.

Mr. R. H. Watson is manager and Mr. J. A. Murphy superintendent, employing on the date of inspection 75 men.

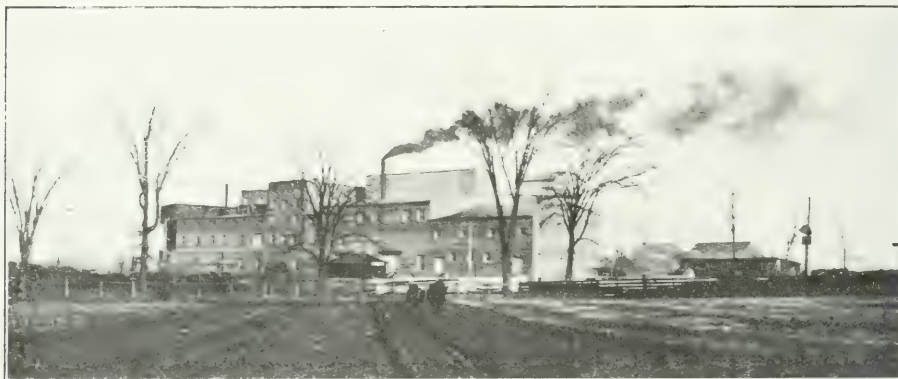
### Gypsum

Near the town of Caledonia, on lots 10 and 11 in the first range, township of Seneca, the Alabastine Company, Limited, operated their gypsum mine and plant for the manufacture of gypsum products continuously during 1913.

The gypsum is high-grade and occurs in a flat-lying bed about 80 feet below the surface. It is mined by the pillar and room method, the ore being hoisted through an incline shaft, an auxiliary vertical shaft being also provided. Drilling is done by electric rotary drills.

During the year the storage bins of the company, near the Grand Trunk railway station, were burned, and a new building erected at the mine.

Mr. A. J. Parkhurst is manager, employing 125 men in the mine and mill.



Plant of Crown Gypsum Company at Lythmore

### Carson Mine

This mine, owned and operated by the Alabastine Company, is situated about three miles south of Caledonia. A good quality of white gypsum is mined here and teamed to the mill at Caledonia. The workings now extend over an area about 350 feet long by 250 feet wide.

The waste rock is used for pillars. A vertical air shaft about 75 feet deep has been sunk, at a distance of 800 feet from the mouth of the main incline shaft. The gypsum bed is about four feet in thickness.

The mine is operated during the summer months.

### The Haldimand Gypsum Company

The above company has been organized to work a gypsum property situated about one mile west of the Alabastine plant near Caledonia.

A 2-compartment vertical shaft, 11 by 7 feet, has been sunk to a depth of 61 feet.

Mr. James Old, Toronto, is president of the company, and on the date of inspection all work was in charge of contractor James Blake, of Caledonia.



#### **Crown Gypsum Company**

The mine operated by this company was formerly known as the Martindale mine, and is situated on lots 58 and 59, Oneida township, county of Haldimand.

The workings are reached by an incline shaft about 500 feet in length, sunk from the west side of the deposit. The gypsum bed, about four feet in thickness, is mined by the pillar and room method, the waste rock being left to support the roof as pillars.

A narrow-gauge railway connects the mine with the Michigan Central railway at Lythmore station, where the grinding plant of the company is situated.

The officers of the company are:—Mr. W. G. Case, president, Buffalo, N.Y.; Mr. C. E. Williams, manager, Lythmore, Ont.; Mr. G. C. Fischle, superintendent, Lythmore, Ont.

Thirty men are employed at the mine and 15 at the mill.

#### **Quarries**

##### **Battle Quarry**

This quarry, situated in the town of Thorold, has been closed for the past three years. Some years ago a large quantity of stone was supplied from this quarry for use in the construction of the old Welland canal. It is probable that the new work now being carried on in connection with the new canal will revive the quarry industry in the vicinity of Thorold.

##### **Canadian Quarries**

Near Stoney Creek, in Saltfleet township, the Canadian Quarries, Limited, opened up a quarry for the production of crushed limestone.

Mr. O. E. Quigley, of 26 Fairleigh Avenue, Hamilton, is manager, employing 20 men.

##### **Canada Cement Company**

Near Port Colborne, the Canada Cement Company are engaged in quarrying limestone and excavating clay for use in the manufacture of cement.

The working face in the quarry averages 20 feet in depth, and 5-inch holes are drilled by a Clipper deep-well machine. Two Marion steam shovels load the broken rock into cars. Electric power purchased from the Ontario Power Company is used to operate the quarry machinery.

Mr. S. R. Preston is manager, employing 25 men in the quarry.

##### **Cartmell Quarry**

Within the town limits of Thorold, William Cartmell worked the above quarry at intervals during the year. At the date of inspection four men were employed. Mr. Cartmell ships dimension stone and rubble.

##### **Canada Crushed Stone Corporation**

Near the town of Dundas, on lots 12 to 15, in the first concession of the township of West Flamboro, the above company (successors to Doolittle and Wilcox) are quarrying limestone.

The crushing plant is one of the largest in the Province, and was fully described in the Report of the Bureau of Mines for 1912.

Work on a large scale was continued during 1913.

Mr. J. D. Small is superintendent, employing 60 men.

##### **Chalmers Quarry**

On the west side of Owen Sound Mr. David Chalmers operates a quarry for use in the production of lime. The kiln is situated about 500 feet from the quarry, and the broken limestone is hauled in carts and dumped directly into the kiln.

Five men are employed.

**Empire Limestone Company**

During 1913 this company continued to operate their quarry and sand pit on lots 4 to 6, in the first concession of the township of Humberstone. Most of the product is shipped to Buffalo, about 14 miles distant. An area of about 16 acres has been worked over, and the quarry at the present level has reached the limit of its northern boundary. An additional Browning hoist and clam shell were put in operation during the year in the sand pit on the lake shore.

The plant is operated entirely with steam, and has been described in previous reports of the Bureau of Mines.

Mr. T. R. Thomas is manager, employing on the date of inspection in July, 1913, 125 men.

**Fleming Quarry**

In the ninth concession of the township of Esquesing, and a short distance east of the Logan quarry, Mr. J. Fleming is quarrying limestone, employing 30 men throughout the year.

The plant consists of two guyed and one stiff-leg derrick, one double-drum Beatty hoist. The product is shipped in the form of dimension building stone and rubble.

Mr. M. G. Bell is manager.

**Gallagher Lime and Stone Company**

On lot 15, in the sixth concession of Barton township, this company are quarrying limestone for use in the manufacture of lime. The company also ships rubble and dimension stone, principally to the trade in Hamilton.

Mr. Dan A. Gallagher, Hamilton, is manager of the company, employing 10 men.

**Hagersville**

On lot 14, in the thirteenth concession township of Walpole, The Hagersville Contracting Company operated their limestone quarry continuously during 1913. This quarry is one of the oldest in the Province, and a large area has been worked out.

Mr. J. C. Ingles is manager, employing 45 men.

**Hagersville Crushed Stone Company**

About one mile east of the town of Hagersville, on the line of the Michigan Central railway, the above company opened up a limestone quarry and operated it till December 1st, 1913. The plant consists of one 60-h.p. locomotive type boiler, one No. 4 Austin crusher, one No. 5 Gates crusher, and a screening plant.

Mr. Robert Hambleton is manager, and when operating employs 20 men.

**Harrison and Beatty**

About two miles south of Owen Sound, on the Beatty farm in Sydenham township, Messrs. Harrison & Beatty, of Owen Sound, opened up a limestone quarry for the production of rubble stone and all sizes up to two inches. A siding from the Canadian Pacific railway has been built to the plant, and storage bins erected. The plant consists of one double-drum Maundy hoist, one 25-h.p. upright boiler, one 25-h.p. return tubular boiler, one No. 4 Austin crusher.

Mr. Robert Nelson is superintendent, employing 10 men.

**Harvey**

Near the village of Rockwood, Messrs. E. Harvey, Limited, quarry limestone for use in the manufacture of white lime. Three kilns are in operation. Hydro-electric power is used to run the quarry machinery and kiln fans.

Mr. E. Harvey is manager, employing 25 men.

#### Longford

At Longford Mills in Rama township, about seven miles south of Orillia, the Longford Quarry Company operate a limestone quarry for the production of dimension building stone.

Mr. William Thomson, Orillia, is president, and Mr. John Meikle superintendent, employing 27 men.

#### Logan

On lot 27, in the eighth concession township of Esquesing, Mr. Hugh Logan is operating a limestone quarry, shipping dimension stone and rubble. The output is hauled to the Grand Trunk siding near Glen Williams.

Thirty-eight men are employed.

#### Michigan Central

Near the town of Hagersville, and adjoining the quarry of the Hagersville Contracting Company, the Michigan Central Railway Company operated their limestone quarry during the summer months of 1913. An area of ten acres has been worked out to an average depth of twenty feet.

The output is used by the railway company for surfacing material, and some dimension stone is quarried for use in pier construction.

Mr. D. E. Cronin is superintendent, and on the date of the inspection 60 men were employed.

#### Marshall

On lot 14, concession 7, Barton township, about two miles from the city of Hamilton, Mr. James Marshall quarries limestone for use in the manufacture of lime. During the summer months 25 men are employed.

#### Oliver and Webster

Within the town limits of Owen Sound on the east side, Messrs. Oliver and Webster quarry a 13-foot face of limestone. Electric power is purchased from the municipality to operate the quarry and crushing machinery. The product is shipped as rubble and crushed stone.

Mr. Keith Webster is manager, employing 40 men.

#### Owen Sound Lime Works

On the west side of the town of Owen Sound the above company quarry limestone for use in the manufacture of lime. The kilns have a capacity of 400 bushels per 24 hours.

Mr. Oliver Brown is owner and manager, employing seven men.

#### Queenston

On lots 47 and 48, in the third and fourth concessions of Niagara township, near the village of St. Davids, the Queenston Quarry Company are quarrying limestone for use as building material and also as crushed stone for road material and concrete work.

The equipment consists of: 4 double-drum Beatty hoists with derricks, 1 Belleville hoist and an A frame sand clam shell derrick with Beatty hoist. These hoists are all steam operated, with six small upright boilers.

A 350-cubic foot compressor, motor-driven, supplies air for the drills.

The crushing plant is equipped with a No. 5 Austin crusher and a Simons disc crusher, both motor-driven. Electric power is purchased from the Ontario Distributing Company.

Mr. Charles Lowery is manager, employing 60 men.

#### St. Mary's Horse Shoe Quarry

This quarry is situated within the town limits of St. Mary's, and during the summer months of 1913 was operated by the present owner, Mr. R. H. McWilliams.

Three acres have been worked out to an average depth of 45 feet. Hydro-electric power is used to operate the quarry and crushing machinery. Work was discontinued in November.

Twenty-five men were employed on the date of inspection.

#### St. Mary's Portland Cement Company

Within the town limits of St. Mary's, in Perth county, the above company are quarrying limestone and excavating clay for use in the manufacture of cement. The broken rock is handled by three stiff-leg derricks, and dumped direct to a No. 8 Kennedy gyratory crusher. The crushed material is carried to the mill on a belt conveyor 300 feet in length. A 1,250 cubic foot Imperial Type 10 compressor supplies air for the drills.

The quarry has now an average depth of 40 feet, including 10 feet of overburden. The plant began operations in 1912, and in 1913 400,000 barrels of cement were manufactured.

A safety committee of officers and employees meets regularly, and all precautions are taken both in the quarry and cement plant to minimize accidents among the workmen.

The officers of the company are: president, Mr. George H. Gooderham, Toronto. secretary, Mr. Mark Irish, Toronto; manager, Mr. J. G. Lind, St. Mary's.

Forty men are employed in the quarry.

#### Standard White Lime Company

This company operate under one management four limestone quarries in south-western Ontario, manufacturing lime. At St. Mary's there are two kilns, and 15 men are employed under Mr. James Selater. In Puslinch township, just outside the western city limits of Guelph, there are three kilns, with a combined capacity of 20 tons of lime per day. At this point the company have in operation a large hydrating plant. Twenty-two men are employed, under Mr. George Gates.

In Guelph city there are two kilns in operation, and here the quarry has an average depth of 15 feet. Fifteen men are employed, under Mr. D. Wardell.

At Beechville, near Ingersoll, the company operate a large quarry, employing 40 men. Hydro power is used at all the plants.

Mr. Kennedy is manager of the company.

#### Thames Quarry

In St. Mary's the Thames Quarry Company operated their limestone quarry continuously during 1913. The rock here is of excellent quality, both for fluxing material and road-making.

Crushed stone, rubble and dimension stone for building purposes are shipped. In 1913 the output was considerably increased, the bulk of the rock going to the cities and municipalities for use in road-making. The quarry is now 600 feet long by 250 feet wide, with an average depth of 37 feet. The company have recently erected a plant for the manufacture of cement brick at the northeast end of the quarry. The fine material and waste rock will be used in this plant.

Mr. David Bonis is president, and Mr. John Bonis manager and secretary.

Thirty men are employed in the quarry and crushing plant.

#### Toronto Lime Company

At Limehouse, in the township of Esquesing, and at Dolly Varden, on lot 23, in the third and fourth concessions of the township of Esquesing, the above company quarry limestone for use in the manufacture of lime.

At Limehouse there are two kilns in operation, with an output of 30 tons of lime per day, and at Dolly Varden there are two kilns, with a combined capacity of 14 tons.

Mr. William Gowdy is manager, employing 40 men at Limehouse and 25 at Dolly Varden.



#### Wentworth

On lot 4, in the fifth concession township of Saltfleet, the Wentworth Quarry Company operated continuously during 1913.

The limestone is crushed and sized, and five products shipped—rock sand,  $\frac{1}{4}$ -inch,  $\frac{1}{2}$ -inch, 1-inch and 2-inch rock. The plant was fully described in the 1913 Report of the Bureau of Mines.

Mr. F. W. Schwendiman is manager, employing 30 men.

#### Welland County Lime Works

About three miles west of Port Colborne, in the township of Wainfleet, two limestone quarries are being worked by the above company. From quarry No. 1 limestone of excellent burning quality is produced for the manufacture of lime. No. 2 quarry is operated for rubble only.

Mr. John Reeb is manager, employing 10 men.

#### Walker's Quarry

In the town of Thorold Mr. David Walker employs 12 men excavating dimension stone and rubble. The quarry is 40 feet in depth.

#### Canada Iron Corporation

On lots 5 and 6, front range of Rama township, the above company operate a limestone quarry for the production of fluxing material, for use in their blast furnaces at Midland.

Mr. Fred Morgan is superintendent, employing at the date of inspection 75 men.

The material is loaded on cars at the quarry near Longford Mills and shipped via Grand Trunk railway to Midland.

### SAND AND GRAVEL

The excavations of the following companies producing sand and gravel were inspected during the year:

The Armstrong Supply Company, Hamilton.

Bartonville Gravel Pit, Hamilton.

Clifton Sand and Gravel Company, Stamford.

W. M. Webb, gravel pit, Hamilton.

Yates gravel pit, Hamilton.

Edward New, gravel pit, Hamilton.

Kingston Sand and Gravel Company, Kingston.

The shale and clay excavations of the following companies, engaged in the manufacture of brick, were inspected during the year:

Brandon Pressed Brick and Tile Company, Milton.

Barton Pressed Brick Company, Bartonville.

Breslau Brick Company, Breslau.

Crawford Bros., Hamilton.

W. H. Cooper, Hamilton.

Canadian Pressed Brick Company, Hamilton.

Halton Brick Company, Terra Cotta.

Milton Pressed Brick Company, Milton.

George E. Mills, Hamilton.

Edward New, Hamilton.

Ollman Bros., Hamilton.

Owen Sound Brick Company, Owen Sound.

Paxton and Bray, St. Catharines.

Toronto Pressed Brick Company, Milton.

Terra Cotta Pressed Brick Company, Terra Cotta.

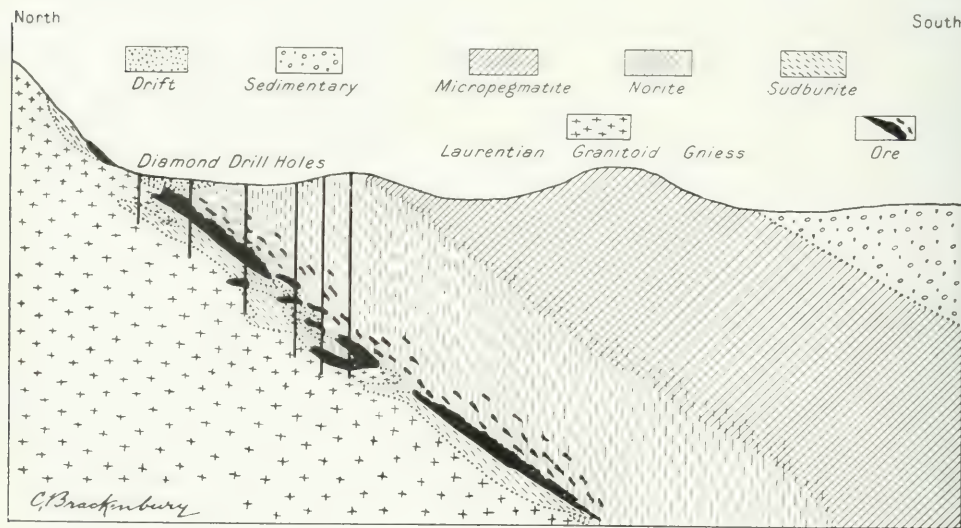
## NOTES ON THE ROCKS AT LEVACK

By C. Brackenbury

Last year diamond-drilling operations were carried on under the writer's charge in Levack township, on the northern side of the Sudbury Nickel field. A marked feature in the drill cores was the continual recurrence of a very fine-grained moderately basic-looking grayish rock, the true character of which could not be determined satisfactorily in the field. This rock was generally found either directly adjoining, or in close proximity to, the ore body, and also in contact with the Laurentian granitoid-gneiss.

In order to determine the true character of the fine-textured gray rock, to name it correctly, and ascertain its proper relationship with the ore body and the surrounding country, sections of some of the rock samples were made and examined microscopically at the University of Toronto. Altogether 29 sections were examined, the results showing that they may be classified as follows:

- A. Sudburite (older norite)—1, 2, 3, 4, 5, 6, 7, 8, 9.
- B. Norite (nickel-bearing eruptive)—10, 11, 12.
- C. Altered or transition rocks, some of which may be derived from sudburite—13, 14, 15, 16, 17, 18.
- D. Local types, partly micropegmatitic—19, 20, 21, 22.
- E. Micropegmatite—23, 24.
- F. Laurentian, granitoid-gneiss and more basic phases—25, 26, 27, 28.
- G. Olivene-diabase dike—29.



Ideal Section, Levack Township

### A—Sudburite

Sections 1 and 2 show the most characteristic features of this rock, and may be described as typical examples. Under the microscope about half the rock is seen to consist of plagioclase, and about one-third of the monoclinic pyroxenes diallage and augite, the remainder being made up of magnetite, a little secondary amphibole and a little orthorhombic pyroxene, probably hypersthene or enstatite. The extinction angles of the plagioclase are those of labradorite and bytownite, and the crystals are small and broad, with few twin lamellæ. Much of the pyroxene shows the fibrous and herring-

bone structure of diallage and there is some uralitization. The greater portion shows oblique extinction, but in a few places a little pyroxene may be seen with parallel extinction, and slight pleochroism, showing the presence of hypersthene or enstatite. The magnetite, like the plagioclase and pyroxene, is distributed throughout the rock. It appears chiefly as irregularly shaped grains of moderate and of minute sizes. The amphibole is chiefly the pale green fibrous variety uralite, and is plainly a secondary mineral derived from the pyroxene. There is also a little pale green-brown hornblende.

Sections 1 and 2 show no biotite, but there is a little to be seen in sections 3, 4, 5, 6, 7, and 9. Quartz is present in 3, 4, and 5, in small quantity, and other occasional accessories are apatite and calcite. No. 8 contains more plagioclase and less pyroxene than the average. Hypersthene is plainly to be seen in sections 3, 8, and 9.

Sections 1 and 2 represent greenstone rocks outcropping at the edge of the muskeg swamp, in contact with, and overlying, the Laurentian granitoid-gneiss. Both these rocks appear to the eye as close-grained, compact and greenish-gray. No. 1 was much iron stained and No. 2 very magnetic. All the other sections under this heading represent pieces of core taken from the diamond drill holes at various depths. The rock represented by these cores was generally found near the ore deposit, either underlying the main body or enclosed within portions of the pyrrhotite, and in some cases penetrating the Laurentian one or two hundred feet from the norite contact.

Section 3 represents a piece of core taken from near the bottom of the ore body, where it was very thick. This core came from a depth of 700 feet below the surface, and at about the same distance horizontally from the outcrop. A good deal of similar gray rock and small portions of granitic rock were found in several places above. The main body of the Laurentian gneiss was apparently entered at a depth of 750 feet to 790 feet. Under the microscope this section shows the typical plagioclase of the older norite, consisting of small, short, stout crystals with few lamellæ and extinction angles of labradorite and bytownite. The plagioclase makes up about half the rock. The pyroxene occurs in fairly large aggregates, partly amphibolized. There is more hypersthene present than in sections 1 and 2, and a good deal of the diallage has been altered to uralite in the same way. The magnetite is typical, being scattered through the rock in moderate and minute grains. A little biotite and quartz are present.

Section 4 represents a piece of core from a drill-hole put down about 200 feet south of the base of the Laurentian hill. This piece of core was taken from near the bottom of the ore body at a depth of about 440 feet and just above a six-foot layer of good pyrrhotite. Microscopically, it differs from Nos. 1 and 2 in showing larger irregular aggregates of pyroxene, and there is more hornblende present.

Section 5 comes from a piece of core in the same hole at a depth of 451 feet, that is, just below the last six feet of ore, and just above an included or protruding mass of the granitoid-gneiss. This section shows less magnetite than is typical, but a good deal of quartz and biotite. The presence of so much quartz is perhaps due to the proximity of the granitoid-gneiss.

Section 6 comes from core in the same hole as Nos. 4, 5, and 25, at a depth of 467 feet, and just below this at 468 feet the main body of the granitoid-gneiss is entered. The peculiar feature of this section is the presence of a secondary light-brown hornblende which occurs throughout intimately mixed with the pyroxene. The plagioclase and magnetite are fairly typical. No quartz was noticed.

Section 7 represents core from the same hole as Nos. 10, 19, 20, 21, 22, that is at a distance of about 800 feet from the outcrop, but the depth is not specified. To the eye it is the usual fine-grained compact gray rock. Examined under the microscope it is seen that about half the rock is plagioclase (labradorite), with crystal boundaries mostly crowded together and not freely formed. The individuals are generally larger than in sudburite (older norite), but not so large or well formed as in norite. They have the short, broad shape characteristic of sudburite, but rather more lamellæ than is usual. The pyroxenes form an indefinite aggregate with amphiboles. There are indications



of hypersthene, augite and diallage largely altered to a pale green-brown hornblende and uralite. The whole aggregate is impregnated with magnetite, chiefly in minute grains. A very little biotite is present as small specks. The rock is probably the older norite, but might be placed under heading C.

Sections 8 and 9 are interesting, as the cores were taken from depths of about 200 feet and 100 feet respectively below the surface of the steeply inclined Laurentian hill where it rises to the north of the muskeg swamp. Neither of these holes proved up any ore, but they have now shown that the compact feldspathic gray rock which they penetrated at various points down to depths of 100 feet and 200 feet, is really the older norite. It is plain, then, that the sudburite here penetrates crevices and hollows in the Laurentian formation. This, with the evidence of the other bore holes passing through the ore body, and that of the outcropping rocks represented by sections No. 1 and 2, clearly indicates that the sudburite occurs here, probably in the form of an eruptive sheet, generally underlying the nickel-bearing norite, and overlying, and in some places even penetrating, the Laurentian granite.

Under the microscope sections 8 and 9 are somewhat similar. In section 8 about two-thirds of the rock is made up of the typical plagioclase of the sudburite. In section 9 the proportion of plagioclase is somewhat less. The pyroxenes, diallage and hypersthene, occur in fairly large, irregularly shaped grains, which show much weathering, with formation of the usual secondary products hornblende and uralite. The magnetite is more typical in section 9 than in 8, where it occurs in larger grains, but is not quite so persistent as usual. There is a little biotite in 9, but not in 8. Apatite occurs in both as small scattered crystals. A little epidote and a few specks of pyrite are present in 8, and some calcite in 9. The typical features of sudburite are shown in the plagioclase, pyroxenes and magnetite.

#### **B—Norite, The Nickel-Bearing Eruptive**

Sections 10 and 11 are excellent examples of the basic phase of norite and show the presence of pyrrhotite with much fresh hypersthene. In 10, plagioclase occupies about half the rock and pyroxene about one-third. In section 11 it is the other way about, with pyroxene taking up about half and plagioclase about a third of the rock. The plagioclase shows extinction angles of labradorite and bytownite. The pyroxene is chiefly rhombic, with pale pink to green pleochroic colors, and occurs as fresh-looking crystals of hypersthene. There is also present a little monoclinic pyroxene as augite and diallage, the latter having been slightly amphibolized in places, forming small irregular spots of secondary hornblende or uralite. A good deal of pyrrhotite is present as irregular grains and patches. Biotite is quite conspicuous, and accessories occurring in small quantities are chalcopyrite, quartz, magnetite and apatite. The plagioclase occurs in well-formed crystals of moderate size. The hypersthene also shows some fairly well-formed crystals, but the crystal boundaries of the other minerals are not usually well developed. The pyrrhotite shows no vein structure, but occurs disseminated through the rock like the other minerals, indicating that it has separated out from the original molten magma in the same way, that is to say, by a process of magmatic segregation.

The cores represented by sections 10 and 11 were taken from drill-holes at 800 feet and 600 feet from the outcrop and less than 200 feet above the pyrrhotite ore body. Megascopically, the rock is of medium texture, greenish-gray in color, showing feldspar and a dark mineral, some of which is hornblende. A few specks of biotite and pyrrhotite can generally be distinguished.

Section 12 shows a weathered and somewhat less basic phase of the norite. Megascopically, the rock is medium-grained, gray, feldspathic with pyroxene or hornblende and some biotite. Under the microscope about half the rock is found to consist of plagioclase with extinction angles of labradorite and bytownite. Most of the individual crystals are smaller than those in sections 10 and 11, but larger than those to be seen



in sections of sudburite, and a few crystals are quite large. The pyroxene has been badly weathered and much of it is altered to hornblende, but in the section there are three or four large pieces of diallage left, which are wrapped round feldspar crystals, showing a well-marked ophitic structure.

No hypersthene can be distinguished. The pyroxene makes up about an eighth of the rock, and hornblende, uraltite and biotite about a quarter. Quartz is quite conspicuous, and occurs as a coarse intergrowth with the feldspar, giving an almost pegmatitic appearance in places. A few small pieces of magnetite and pyrite are present.

The core for this section was taken from a depth of about 330 feet and at a distance of about 1,000 feet from the outcrop. The position of this core was much farther from the ore body than in cases Nos. 10 and 11.

### C—Altered or Transition Rocks

Sections 13, 14, 15, 16, 17, 18 show altered or transition rocks, which do not have, in any single case, the chief characteristic features of the sudburite or of the nickel-bearing norite.

Section 13 represents a piece of core from a depth of 40 feet to 65 feet below the surface and about 60 feet from the gossan outcrop. A few feet of pyrrhotite ore occur between 50 to 60 feet in depth, and the granite contact is not far away. Megascopically, the rock is dark gray, fine-grained, showing feldspar, hornblende and chlorite. Under the microscope, fully half the rock is seen to be made up of plagioclase, giving extinction angles of labradorite and andesine. The crystals are above the average size of those found in the older norite, but smaller than the average in the nickel-bearing norite. No unaltered pyroxene can be distinguished, but only secondary products, such as pale-coloured hornblende, uraltite and chlorite, which together make up about a quarter of the rock. Pyrrhotite and pyrite in irregular grains make up most of the remainder, but no magnetite could be clearly distinguished. There are a few small crystals of apatite, and a little quartz is present intergrown with plagioclase. The origin of this rock is somewhat doubtful, but it may be an altered form of norite.

Sections 14 and 15 were taken from portions of greenstone rock, which occur as intrusions or inclusions in the Laurentian hill rising in the north of the swamp. In the field they appear as fine-grained dark greenish-gray rocks, with a few specks of pyrite and rusty iron stains on the surface. Under the microscope, both sections show plagioclase to make up about half the rock. In section 14 the extinction angles are those of labradorite and bytownite, and the shape and size of the plagioclase crystals are fairly typical of sudburite. In section 15 the extinction angles are those of labradorite and the size and characteristic features are partly like the sudburite and partly like norite. About half of No. 14 is made up of a cloudy aggregate dividing the feldspar about evenly. In this aggregate some augite and uraltite may just be distinguished with a little magnetite scattered throughout. There are a few specks of pyrite, and a fragment of calcite lies on the edge of the section. The rock represented by section 14 may be derived from sudburite which has been a good deal altered and decomposed.

In section 15 about one-third of the rock is made up of pyroxene and its alteration products. This may be divided into three parts about equal in quantity: (a) hypersthene, (b) diallage, (c) secondary hornblende or uraltite. The remainder of section 15 consists chiefly of magnetite, pyrrhotite and a very little chalcopyrite. This rock, with intermediate characteristics of plagioclase and some pyrrhotite as well as magnetite, may be derived from sudburite or norite, or it may even be a transition form between the two, due to contact and digestion of sudburite by norite.

Sections 16 and 17, like 14 and 15, are from greenstones found in the granitoid-gneiss. These rocks are much decomposed, and at present appear to be made up chiefly of plagioclase and secondary hornblende. There is also present augite, diallage, magnetite, biotite, epidote and a little quartz. They may have been derived from sudburite, but it is better not to call them anything but basic eruptives in the Laurentian.

Section 18 shows the contact line between the granite and greenstone. The rock is much altered and not worth describing.

### D—Local Types, Partly Micropegmatitic

The rocks under this heading are more acid than those under headings A, B, C. The increase in the quantity of silica, while retaining some of the features of norite, may be due to a partial exchange of constituents between the norite and included masses of granite through a process of digestion, or it may be simply due to local acid excretions from the norite.

Section 19. The core from which this section was taken came from the same drill-hole as No. 10, but about 10 feet deeper, that is, at a depth of 460 feet. Section 10 showed a good example of typical norite, with much basic plagioclase and a good deal of hypersthene. In section 19 about half consists of a micrographic intergrowth of quartz and kaolinized feldspar (orthoclase and plagioclase). The remainder is made up of phenocrysts of pale green hornblende, a little diallage, some brown biotite, pyrite and magnetite. Megascopically, the rock is gray feldspathic, with feldspar, hornblende and biotite plainly visible.

Section 20 was taken from a piece of core 15 feet below the core for No. 19. The rock is finer grained than No. 19, and more decomposed. A good deal of secondary hornblende can be distinguished and there is some micrographic intergrowth of quartz and feldspar. A little biotite and magnetite is present. The rocks shown in sections 19 and 20 may be just local acid excretions from the norite eruptive.

Section 21 represents a piece of core from the same hole as Nos. 19 and 20, but at an unspecified depth. Megascopically, it is a coarse-grained rock; about half is granitic, showing pinkish feldspar and quartz; the other half is made up chiefly of hornblende. Under the microscope a little plagioclase can be distinguished as minute crystals in kaolinized feldspar. About half of the section shows hornblende with some plagioclase and quartz; the other half consists chiefly of a coarse pegmatitic intergrowth of quartz and feldspar. Some epidote is present and a little pyrrhotite and pyrite.

The rock represented by this section may be from an included mass of the Laurentian, and its peculiar features may be due to the influence of the norite eruptive in which it is enclosed.

Section 22 represents a piece of core from the same hole as Nos. 10, 19, 20, and 21, but at a depth of only 170 feet. It has somewhat the appearance of marble; is grayish-white in color, and the fracture surface shows a vitreous to pearly lustre. Under the microscope, much decomposed material appears to be made up of kaolinized feldspar with a light brown hornblende. Quartz is intergrown with some of the feldspar forming a coarse pegmatitic structure. A large portion of the section is made up of calcite. The rock appears to be a secondary product, and may be considered as vein matter in the norite.

### E—Micropegmatite

Section 23 represents a piece of core from a depth of about 70 feet and about 800 feet from the outcrop. The pyrrhotite ore body is first intersected here at a depth of 600 feet. Megascopically, the rock is of medium texture, mostly gray-green in colour, but faintly pink in places. Feldspar, quartz and fibrous hornblende are plainly visible. Under the microscope, it is essentially composed of a micrographic intergrowth of quartz and feldspar, with a good deal of fibrous hornblende. The accessories are magnetite, biotite and a few little crystals of apatite. About one-third of the whole is composed of quartz, one-third of feldspar and nearly one-third of hornblende. In addition to the micrographic intergrowth, the quartz occurs as a few large fragments with small apatite inclusions. This rock represents an intermediate acid phase of the norite, which has not quite reached the stage of a typical micropegmatite.

Section 24.—The rock for this section was taken about a quarter of a mile south of the granite contact, and approaching the area of the norite acid phase. In this case, however, it is too basic for a good example of micropegmatite. Megascopically it appears as a dioritic rock of coarse-grained texture made up of about equal portions of horn-

blende and feldspar with a little quartz. The feldspar has a slightly pink tinge, especially on the weathered surface. Under the microscope, some of the feldspar is seen to be plagioclase, giving extinction angles of labradorite and andesine. A little quartz is present and part of it forms a micrographic intergrowth with the feldspar. About half the rock is made up of greenish-brown hornblende, and there is some sign of a little augite in a transition stage to hornblende. As accessories, a good deal of magnetite is present and a little calcite. This rock, which now has the character of diorite, may be considered as an intermediate stage between the basic and acid phases of the norite eruptive. Under the microscope it has been shown to be further removed from the true micropegmatite than the rock in section 23.

#### F—Laurentian, Granitoid=Gneiss, etc.

Section 25.—The core for this section comes from the same drill-hole as the cores for sections 4, 5, and 6. It was taken at a depth of 452 feet, that is to say, 2 feet lower than section No. 5, and 15 feet higher than No. 6, both of which showed the rock to be sudburite. As already mentioned under the heading of section 6, the main body of the Laurentian is penetrated by the drill-hole at a depth of 468 feet. From the evidence given by this hole and other drill-holes in the immediate neighborhood, it appears that the nickel-bearing eruptive near its contact with the Laurentian contains blocks of the older norite and of the Laurentian granite, also that tongues of the older norite penetrate the Laurentian, and both the older norite and the Laurentian have been penetrated by tongues of the nickel-bearing eruptive.

Megascopically, this rock shows a slightly gneissic structure, the hornblende being somewhat banded in the feldspar and quartz. The feldspar has a slightly pink tinge. Under the microscope, the feldspar is seen to be kaolinized and cloudy, and the quartz shows uneven extinction due to strain. About half the rock consists of feldspar and the remainder of hornblende and quartz, with a little magnetite and pyrite as accessories. The rock is evidently a piece of the Laurentian granitoid-gneiss.

Section 26 represents a piece of the lighter coloured portion of the rock taken from the surface of the Laurentian hill. Feldspar (dull white to faintly pink in color), quartz and hornblende are visible to the eye, and the rock has a slightly gneissic appearance. Under the microscope the feldspar, which makes up about half the rock, is seen to be much decomposed and appears to be chiefly orthoclase. Quartz is abundant and shows uneven extinction. There is a good deal of hornblende, but it is not well developed. A little magnetite is present and a few spots can be seen of a brownish mineral, which is perhaps limonite. This rock represents the acid phase of the Laurentian.

Section 27 represents a piece of core taken from a depth of 418 feet in a drill-hole about 400 feet from the outcrop. The ore body here lies about 50 feet higher. The core is closely speckled grayish-green, somewhat granitic in appearance, with grayish-white feldspar, green hornblende and a little epidote visible. A slight tendency to banding may be observed. Under the microscope the feldspar is seen to be much decomposed and partly altered to epidote. The feldspar appears to be chiefly orthoclase, but with some plagioclase giving extinction angles of andesine. In addition to the feldspar, hornblende and epidote which make up the rock in about equal proportions, a few small grains of titanite are present. This rock may be classified as a syenitic gneiss, and it represents a less acid phase of the Laurentian than the rocks shown in sections 25 and 26.

Section 28 represents a piece of the darker-coloured rock from the surface of the Laurentian hill. About half is made up of hornblende and the remainder is chiefly feldspar and quartz. It has a slightly gneissic structure. Under the microscope about half is shown to be hornblende. Quartz is distributed throughout, but makes up less than a quarter of the whole. Part of the quartz shows a micrographic intergrowth with



the feldspar. The latter, which occurs in subordinate quantity, is much decomposed, but is apparently chiefly plagioclase. There is a very little magnetite, some of which has been altered to hematite. The rock may now be called a quartz-diorite, and is a somewhat basic phase of the Laurentian.

### G—Olivene-Diabase Dike

Section 29.—This sample of rock was taken from the surface of a narrow dike which cuts the Laurentian. To the eye it is an almost black compact rock showing minute lath-shaped crystals of white feldspar. Under the microscope, about half consists of a dark glassy ground-mass and one-third of plagioclase. The plagioclase is divided into lath-shaped crystals of two periods of consolidation. The larger crystals occur as phenocrysts with other porphyritic crystals or grains of augite and olivene, which all belong to the earlier generation; the smaller crystals, those of the second generation, occur throughout the glassy base as little needles. The larger crystals show extinction angles of labradorite and bytownite, and make up the greater portion of the plagioclase. Many of these crystals contain glassy inclusions. Olivene appears to predominate over the augite, although in some cases it is not easy to determine definitely the exact mineral of the phenocrysts. A few light-brown octagonal crystals of augite can be clearly distinguished, and the olivene appears as almost colorless to faint yellowish-green crystals and grains. Part of the olivene has been altered to serpentine, and there is indication of chlorite. Some mineral grains are stained reddish-yellow, probably due to the presence of iron oxide. The olivene and augite individuals are packed in between, and wrapped round the larger crystals of plagioclase, showing a fairly well developed ophitic structure. In this section no magnetite could be distinguished, most of the iron being probably contained in the dark, glassy ground-mass.

### Relationship of Sudburite to the Ore-Deposit

Probably the subject of chief general interest in the foregoing notes is that referring to the presence of sudburite in considerable extent on this part of the northern nickel range. In Dr. Coleman's report in the Bureau of Mines, 1905, page 81, he mentions the older norite as occurring in Wisner township, north of Joe's lake, but as not having been, at that time, observed elsewhere on the northern range, and I do not think there has since been any new record of its appearance in another part of the northern range. In the same report Dr. Coleman shows that the older norite (sudburite) has been proved to extend, with some interruptions, from the Gertrude mine in Creighton township easterly along the southern nickel range to the Blezard mine in Blezard township. Now, it seems to be of considerable interest to be able to show that a similar rock occurs in Levack township, which is directly opposite Creighton township, and on the north side of the basin. In this paper it has also been shown that, at Levack, the sudburite occurs at or near the margin of the nickel-bearing norite, as is the case along the southern range. This new evidence, then, tends to show a direct connection between the older norite found on the north and south sides of the basin, just as the connection between the nickel-bearing norite was established some time ago. In the same way it confirms Dr. Coleman's statement that: "It is highly probable that the lava flows, etc., of the older norite represent an earlier outbreak of material from the same general magma as supplied the nickel eruptive."

The descriptions given under the headings A and C show that the sudburite is generally found to occur near the bottom of the ore body or nickel-bearing norite, and overlying or penetrating the Laurentian granitoid-gneiss. This is, of course, a useful fact to know as a guide to exploration work, for, where the older norite is found and other conditions are favorable, then the place to look for the ore body is farther in the direction of the dip, since the nickel-bearing norite, in general, overlies the sudburite.



### Points Confirming the Theory of Magmatic Segregation

It may be mentioned that the character of the ore deposits at Levack adds further confirmation to the theory of magmatic segregation, which has been so ably advocated by Dr. A. E. Barlow, Dr. A. P. Coleman, Dr. T. L. Walker and other well-known authorities. On pages 18 and 19 of his report (1905), Dr. Coleman gives seven arguments in favor of the magmatic theory, and most of the points can be plainly observed at Levack. The facts in agreement which I have noticed may be briefly stated as follows:—

1. The ore is everywhere associated with the norite eruptive.
2. Norite and ore are mixed in every degree from rock enclosing scattered particles of ore, to almost pure ore with a few rock-forming minerals scattered through it.
3. Except as included blocks or where influenced by direct contact with the nickel-bearing eruptive, the adjoining granitoid-gneiss is not spotted with ore, nor does it have separate bodies of ore enclosed in it.
4. The freshest norite is generally close to the ore bodies, and is often specked with ore. The best preserved hypersthene is found in sections containing sulphides, and not in specimens free from sulphides and at a further distance from the ore deposits. (See sections 10, 11, 12.)
5. As far as the writer has yet seen, there is little trace of the agency of water in forming the ore bodies. There is practically no vein, banding or concentric structure. No plain indication of a process of replacement was noticed in the sections showing pyrrhotite ore.
6. The character and quality of the ore body is comparatively uniform at places a considerable distance apart.
7. There is a well-defined bay in the Laurentian formation where the chief ore body outcrops, and its shape there is in the form of a trough, although it flattens out farther in the direction of the dip. These conditions conform to the theory of the ore settling in hollows under the molten sheet.

In closing I wish to express my grateful acknowledgment and thanks for the help and laboratory facilities given to me by Dr. T. L. Walker, and for the kind assistance of Dr. A. P. Coleman, with whom I discussed the sections recorded as sudburite. Dr. Coleman, of course, first discovered the presence of the older norite in the Sudbury nickel field, and he describes it fully in his report, 1905. He has lately given it the name of "sudburite," which name I have made use of in this paper.

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### Prefatory Note to Dr. Coleman's Paper

Dr. Coleman handed this paper in for publication on the eve of his departure from Canada for a trip of six months' duration. It has been published during his absence and he has not had an opportunity to read the proof sheets.

While Dr. Coleman's descriptions of the relations of the pre-Cambrian rocks agree, for the most part, with those by Mr. Cyril W. Knight and myself in Part 2 of the XXII Report of the Bureau of Mines, pages 122-138, his age classification of the rocks differs in some important respects from ours. We believe that Logan, in his description of the Lake Huron region, clearly intended to restrict the name Laurentian to rocks that are older than those we now call the Sudbury or Timiskaming series. Hence we would place in the Laurentian what Dr. Coleman calls "Granites Eruptive through the Keewatin," and which he classes as pre-Laurentian. To those granites and gneisses which Dr. Coleman calls "Laurentian in Eruptive Contact with Lower Rocks" we give Lawson's name Algoman.

The granites and gneisses to which Logan first applied the name Laurentian lie adjacent to the Ottawa valley, a considerable distance east of the north shore of Lake Huron. Our work in southeastern Ontario has shown that large areas of these rocks are older than a series of conglomerates and other sediments that are comparable to the Sudbury, or Timiskaming, series.

Moreover, the Sudbury, or Timiskaming, series of Lake Huron, Cloche mountains and elsewhere, as well as the rocks to which Dr. Coleman gives the name Lower Huronian, were called Huronian by Logan and Murray. They knew that some of these fragmental rocks in the region were intruded by masses of granite and gneiss, but the great unconformity between the two groups was not recognized. While we believe that Dr. Coleman's Sudbury series, or what we have called the Timiskaming, is as much entitled to the name Huronian as is the group to which Dr. Coleman applies the name Lower Huronian, we prefer, for the present at least, to drop the name Huronian for both groups and to call the lower one Sudburian or Timiskamian, and the upper one Animikean. Up to the present it has not been proved that the group called Lower Huronian or Ramsay Lake series by Dr. Coleman is different in age from the so-called Animikie of the nearby Sudbury basin. The unconformity between the Lower Huronian and the Upper Huronian of Dr. Coleman, while somewhat widespread, is comparatively slight.

Considering the great thickness of sediments in the Sudbury or Timiskaming series, it seems to us doubtful whether the period of erosion between the Keewatin-Laurentian (Granites Eruptive through the Keewatin in Dr. Coleman's table) and the Sudbury or Timiskaming series was less than that between what Dr. Coleman calls the Laurentian and his Lower Huronian. Measurements of the Sudbury or Timiskaming series are given on page 214 of Dr. Coleman's paper.

The following table will make clearer the agreements and differences between the classification of Dr. Coleman and that of Mr. Knight and myself:

	COLEMAN	MILLER & KNIGHT
POST-LAURENTIAN	Keweenawan.	Keweenawan.
	<i>Discordance</i>	<i>Discordance</i>
	Animikie.	Animikean ( <i>with small discordance</i> ).
	<i>Discordance</i>	
	Upper Huronian.	
PRE-LAURENTIAN	<i>Small Discordance</i>	<i>Great Discordance</i> (Algoman, Eruptive.)
	Lower Huronian.	
	<i>Great Discordance</i>	
	(Laurentian in Eruptive contact with lower rocks)	Timiskamian. <i>Great Discordance</i> (Laurentian, Eruptive.)
	Sudbury Series.	
	<i>Great Discordance</i>	
	(Granites Eruptive through the Keewatin.)	
	Keewatin, probably=Grenville Series.	Loganian { Grenville (Sedimentary) Keewatin (Igneous)

From the Geology of Canada, 1863, it is seen that Logan applied the name Huronian to all the pre-Cambrian conglomerates and associated fragmental rocks of the north shore of Lake Huron. He recognized that certain of these sediments were intruded by granite and gneiss. But he was mistaken in assuming that all of his Huronian rocks were of one age. In other words, he did not recognize that certain conglomerates and other sediments rested on the eroded surface of the granite which was intrusive into conglomerates and quartzites.

The following quotations from Logan's classic volume will make these statements clear:

"The intrusive granite occupies a considerable area on the coast of Lake Huron, south of Lake Pakowagaming [Pakowkami.] It there breaks through and disturbs the gneiss of the Laurentian series, and forms a nucleus from which emanates a complexity of dykes, proceeding to considerable distances. As dykes of a similar character are met with intersecting the rocks of the Huronian series, the nucleus in question is supposed to be of the Huronian age, as well as the greenstone dykes which are intersected by it." (Geol. Canada, 1863, p. 58).

"On Lake Huron the rocks of this [Huronian] series occupy the coast from Shebahahnahning [Killarney] to the mouth of the Mississagui River and in the valley of the Spanish River they appear to have a breadth northward from Lacloche of about ten miles. The rock which there limits them on the north is probably a part of the Laurentian gneiss, though it has been found difficult to distinguish the gneiss in that part from an intrusive granite." (Geol. Canada, 1863, p. 61).

From these quotations it seems clear that Logan desired to restrict the name Laurentian in the Lake Huron region to those granites and gneisses that are older than the oldest conglomerates and other sediments, and that those granites that cut any of the conglomerates or other sediments should be called Huronian. But since his Huronian embraced rocks separated by a great unconformity it seems best to discontinue the use of the name, especially as the Animikie, Ramsay Lake conglomerate (Lower Huronian of Dr. Coleman) and the Cobalt series are all post-Algoman and have not been proved to differ in age.

W. G. MILLER.

# THE PRE-CAMBRIAN ROCKS NORTH OF LAKE HURON

## with Special Reference to the Sudbury Series

By A. P. Coleman

### Introduction

The Sudbury region has long been known for its nickel deposits. These great ore bodies and the eruptive sheet of norite-micropegmatite with which they are connected have naturally attracted much attention, and their relationships have been carefully studied; but the neighboring sedimentary rocks have usually been passed over with only a brief notice, though they are really of great interest and afford the best clue to the solution of the puzzling problems of the Canadian pre-Cambrian. The Sudbury sedimentary rocks with their extension southwest to Lake Huron and west to the typical Huronian region have been traversed and briefly described by a number of geologists, beginning with Murray in 1849,<sup>1</sup> who canoed along the Wanapitei and other rivers which cross the region. He included the whole as either Huronian or Laurentian. Dr. Bell and his assistants were the first to prepare a map of the Sudbury district, with special reference to the nickel mines, but indicating also the adjoining sedimentary rocks.<sup>2</sup> Dr. T. L. Walker a few years later published a rough map of the nickel eruptive and its surrounding rocks and gave a brief description of the sedimentary beds;<sup>3</sup> and still later Dr. Barlow referred to them in his important report on the "Nickel and Copper Deposits of the Sudbury Mining District,"<sup>4</sup> but directed his attention chiefly to the eruptives. Drs. Bell and Barlow are inclined to consider most of the sedimentary rocks as really of eruptive origin, e.g. ash rocks, deposited in the sea.

In 1902 the present writer was directed by Mr. T. W. Gibson, Deputy Minister of Mines for Ontario, to begin field work in the Sudbury region, and in 1905 a map and report on "The Sudbury Nickel Field" was published by the Bureau of Mines.<sup>5</sup> In this report the writer followed the practice of all former students of the region in calling the sedimentary rocks at Sudbury Huronian; though he noted that they included two series separated by a great unconformity and that the lower series was upturned and penetrated by granites and gneisses always mapped as Laurentian.<sup>6</sup>

Logan placed the Huronian unconformably upon the Laurentian in the section given in the Atlas of 1863, and, as his description shows, considered it much younger than the Laurentian,<sup>7</sup> so that there was a serious difficulty involved in grouping all the sedimentary rocks of the Sudbury region as Huronian. The pre-Laurentian graywackes and quartzites near Sudbury were tilted and folded into mountains by the rise of the Laurentian batholiths, and these mountains were carved down and destroyed before the next sedimentary rock, the Ramsay lake conglomerate, was deposited. This

<sup>1</sup> Geol. Sur. Can., 1847-8, pp. 93-124.

<sup>2</sup> Ibid., 1890-91, F.

<sup>3</sup> Quar. Jour., Geol. Soc., London, Vol. LIII (1897), pp. 43-6.

<sup>4</sup> Geol. Sur., Can., Vol. XIV.

<sup>5</sup> Vol. XIV, Part III.

<sup>6</sup> Ibid., pp. 86-93 and 127-9.

<sup>7</sup> Geol. Can., p. 50. "The rock frequently exhibits the character of a compact conglomerate, holding pebbles and boulders, sometimes a foot in diameter, of the subjacent gneiss, from which they appear to be principally derived."





SKETCH MAP  
SHOWING  
**PRE-CAMBRIAN FORMATIONS NORTH OF L. HURON**  
*To accompany Report by A. P. Coleman in Part I Volume 21 Report of Bureau of Mines 1914*

Scale of Miles  
0 5 10 20 30

LEGEND

PRE-CAMBRIAN

Keweenaw

Air

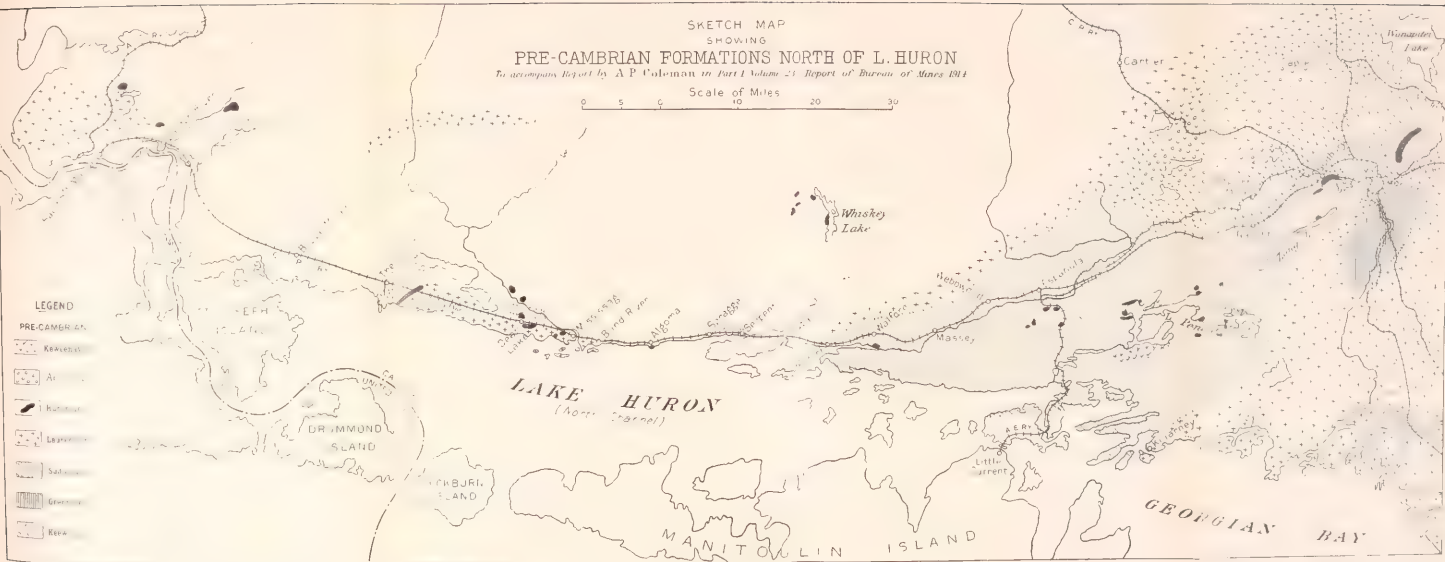
Waukegan

Leavenworth

Sault Ste. Marie

Greenstone

Keweenaw



is perhaps the greatest gap in the geological history of Canada and it is quite unjustifiable to include rocks below and above it in the same system. It was evident that Murray in his brief field work in the Sudbury region had confused two widely separated series under the name Huronian; and that the lower, pre-Laurentian, part should be removed as a distinct series. At first it was thought that the Sudbury rocks might be included in the Keewatin, which was known to be older than the Laurentian; but the great difference between the two groups of rocks, one consisting mainly of clastic sediments, the other mainly of volcanic materials, made this unlikely.

During the past few years while engaged in economic work in the region the problem of the correct classification of the Sudbury rocks has occupied my mind and opportunities have been taken to follow up the field relations from Ramsay lake westward to the Lower Huronian of the typical region. It has been found that basal conglomerates like those of Ramsay lake occur at thirteen points on the way to Thessalon, where the basal conglomerate of the Lower Huronian rests unconformably on the Laurentian. It can hardly be doubted that the Ramsay lake conglomerate belongs to the same horizon as the Lower Huronian, which proves that the sedimentary rocks on which these conglomerates rest are older than the Lower Huronian.

It was decided, therefore, to separate the lower rocks as a "Sudbury Series" from the rocks hitherto mapped as Huronian and to give them a position between the Huronian and the Keewatin. Before these results were published the geologists of the Bureau of Mines had been confronted with a similar problem on Lake Timiskaming, in the Porcupine region, and at other points, and had separated a Timiskaming series, penetrated by granites and covered unconformably by the Cobalt conglomerate, the relations being the same as those between the Sudbury series and the Laurentian and Huronian. Morley Wilson also had defined a Pontiac series in Quebec, which seems to occupy the same position.

Reference to older work showed that sedimentary rocks, including a thick conglomerate, and penetrated by granite and gneiss mapped as Laurentian, occur at several points in the north and west of Ontario, for instance, at Michipicoten, east of Lake Nipigon, at Heron Bay, along Seine River and near Mine Centre in the far west of the province. These sedimentary groups are younger than the Keewatin, since in many places their conglomerates enclose fragments of jasper and of green schist derived from the Keewatin, and they are in all cases older than the granitoid gneiss generally called Laurentian. In the Sudbury-Cobalt-Porcupine region these rocks are almost always steeply tilted where they underlie the comparatively flat Huronian or Cobalt basal conglomerate.

If all of the areas referred to are of the same age, as seems probable, sedimentary rocks intermediate between the Keewatin and the Huronian are widely spread and are of equal importance with the other pre-Cambrian series.

The separation of these older sediments removes many difficulties from the classification of the pre-Cambrian of Canada and should be adopted generally. As the rocks of this age near Sudbury have been somewhat long and carefully studied, occupy a large space and have an estimated thickness of more than 20,000 feet far surpassing the known area and thickness in any other region, probably the whole series may be named the Sudbury series or the Sudburian. The name Timiskaming series, given by Dr. Miller, was earlier in use;<sup>a</sup> but for the reasons just given "Sudbury series" or "Sudburian" seems preferable.

In a paper prepared for the recent Geological Congress on "The Sudbury Series and its bearing on pre-Cambrian Classification," the writer has arranged the various groups of rocks found in the region, including Sudbury and the typical Huronian district as follows:

<sup>a</sup>Eng. and Min. Journ., Sept. 30th, 1911, and Ontario Bureau of Mines, Vol. XIX, Part II.

## POST-LAURENTIAN

Keweenaw (Mamainse, Nickel Eruptive, etc.)

*Discordance*

Animikie (Sediments included in the Nickel Basin).

*Discordance*

Upper Huronian.

*Small Discordance*

Lower Huronian.

*Great Discordance*

(Laurentian, in Eruptive Contact with Lower Rocks).

## PRE-LAURENTIAN

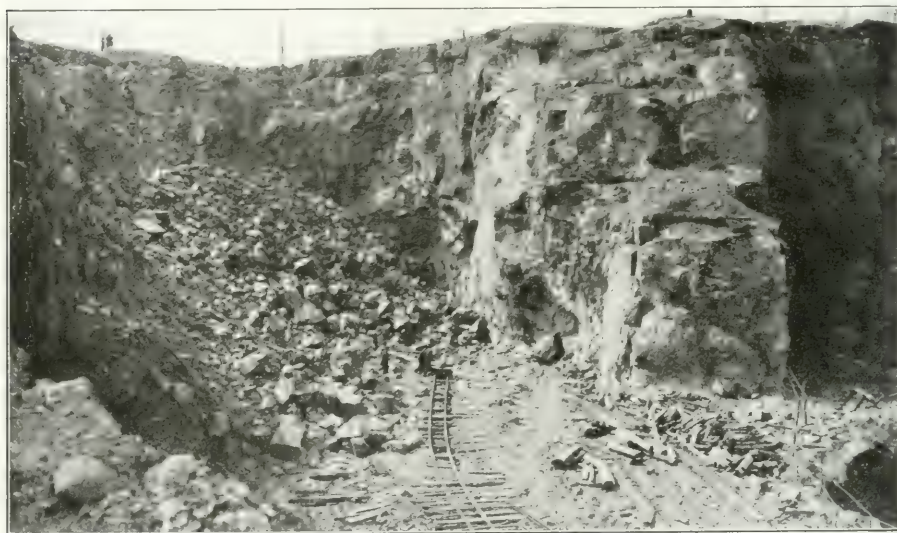
Sudbury Series.

*Great Discordance*

(Granites Eruptive through the Keewatin).

Keewatin, probably=Grenville Series.

The Sudbury series, as here placed, was formed between two great periods of mountain building followed by profound erosion and is therefore separated by a great



Moose Mountain Iron Mine

lapse of time from the Keewatin below and the Huronian above. The subdivisions will be taken up in the order of time, but the Sudbury series, as the most important new element in the classification, will be described more fully than the others.

## The Keewatin

Keewatin rocks occur in small amounts at several places in the Huronian region, but they have attracted little attention. In 1891 Alexander Winchell found that there were older rocks included in the typical Huronian and suggested that they be called Keewatin.<sup>8</sup> The present writer observed bands of green and gray schist enclosed in the Laurentian gneiss east of the basal conglomerate near Thessalon in 1899 and came to the conclusion that "if these rocks were found on the Lake of the Woods there would be no hesitation in assigning them to the Keewatin."<sup>9</sup> As a result of the visit of the International Committee in 1904 it was recommended that the "green chloritic

<sup>8</sup> Bull. Geol. Soc., Am., Vol. II, pp. 85-124.

<sup>9</sup> Bur. Mines, Vol. VIII, Part II, p. 163.



slate" of Logan's classification should be called the Thessalon series and should be assigned to the Keewatin.<sup>10</sup> There can be little doubt that most or all of the areas mapped by Logan and Murray as "green chlorite slate" represent basic lavas older than basal Huronian conglomerate and also than the Laurentian, and that they are probably equivalent to the Keewatin greenstones and pillow lavas of the west. The sedimentary type of Keewatin is represented also, by a very small outcrop of iron formation in Aweres township eight miles north of Sault Ste. Marie, taken up years ago as an iron location. Some test pits show banded silica and magnetite dipping 50° to the east. Just to the south there is Laurentian granite enclosing bands of green schist,<sup>11</sup> and 200 paces to the north one finds Huronian conglomerate charged mainly with Laurentian debris.



Keewatin Iron Formation, Moose Mountain

The most important Keewatin outcrops near the Huronian region are the bands of iron formation north of Batchawana Bay, where many years ago a good deal of striping and other development work was done. About four miles north of the bay a band of jaspery iron formation with some pockets of hematite rises as a ridge which runs for several miles east and west. Five miles north of the Batchawana mine another belt of iron formation runs east and west on the Vulcan and Mammoth properties in Palmer township. The materials here are banded quartzite and magnetite differing totally in appearance from the rock nearer Batchawana. The relations of these Keewatin bands to the Laurentian and Huronian are not well shown, since all the lower ground is drift covered.

<sup>10</sup> Jour. Geol., Vol. XIII, 1905, pp. 101-2.

<sup>11</sup> Bur. Mines, Vol. X, pp. 187-8.

The presence of the vast number of jasper pebbles in the Huronian jasper conglomerate indicates a still hidden outcrop of iron formation with jasper of a brighter red than that found at Batchawana.

East of the typical Huronian region no large outcrops of Keewatin are known, though numerous bands of green schist in the Laurentian may be of that age. Small strips of banded quartzite and magnetite south of Clear Lake near the northern nickel range evidently belong to the iron formation; and much more important outcrops of the Keewatin occur in Hutton township seven miles north of the northern nickel range.

It is very desirable that this Keewatin area should be mapped in detail so as to bring out its general relations to the Laurentian, which cuts it; and to the Sudbury series and also the Lower Huronian which are believed to occur near by.<sup>12</sup> Conglomerate and quartzite are found at various points in the township, but their exact relationships are not known. The banded silica at Moose Mountain is associated with banded schist, and in places is penetrated by gabbro and also by granite dikes coming from neighboring outcrops of Laurentian. The banded iron ore contains 36 per cent. of the metal, but it is much higher in grade, in the proximity of the gabbro, apparently a case of secondary enrichment.<sup>13</sup>

### The Grenville Series

The exact relation of the Grenville to the Keewatin is not shown in the region here described since the two series are not found together; but Miller and Knight in their work in eastern Ontario place the Grenville just above the Keewatin with no unconformity between, the Keewatin consisting of basic lavas and the Grenville including sediments laid down upon the lava sheets.<sup>14</sup> This probably represents the true relationship, and the Grenville should therefore follow the Keewatin as a later sedimentary development in the same great period of time.

The Grenville series was first mentioned in the region north of Lake Huron by Dr. Bell who referred to certain well banded gneisses as sedimentary and of upper Laurentian age, resembling the Grenville series, though without the crystalline limestone usually characterizing that series. These gneisses occur on the southeast side of the band of Huronian quartzite (Sudbury series) mapped in the French River sheet.<sup>15</sup> Beyond this brief reference, containing no details as to the composition of the rocks, no further mention has been made of the Grenville series in the region until very recent years; though T. L. Walker described granite-kyanite gneiss near Wanapitei station in 1897, suggesting sedimentary materials in the Laurentian;<sup>16</sup> and the same occurrence is mentioned by Barlow.<sup>17</sup> The finding of a small patch of crystalline limestone north of Wanup by the present writer recalled attention to the Grenville rocks of the region, which occupy a considerable area.<sup>18</sup>

Recent examination of the so-called Laurentian southeast of the Sudbury region, shows that the Grenville series is really widespread, though of a character differing considerably from the series farther south and east. Crystalline limestone, the most notable rock in the region hitherto described, has been found only in one place, on the Toronto branch of the Canadian Pacific Railway, a mile and a quarter north of Wanup station. The greater part of the Grenville in this region consists of schists and gneisses, containing kyanite, sillimanite and garnet as well as the usual minerals; but toward the southern end there are considerable bands of quartzite.

<sup>12</sup> *Ibid.*, Vol. XII, pp. 318-321; also, Vol. XIII, pp. 216-221.

<sup>13</sup> Guide Book No. 7, Geol. Congress, pp. 35-40.

<sup>14</sup> Guide Book No. 6, Int. Geol. Congress, 1913, p. 56, and Part II, XXII Report. Ontario Bureau of Mines.

<sup>15</sup> G. S. C., Vol. IX, 1896, pp. 9-11, I.

<sup>16</sup> Inaug. Diss., Quar. Jour. Geol. Soc., London, Vol. LIII, p. 42.

<sup>17</sup> G. S. C., Vol. X, 1899, Part I, p. 161.

<sup>18</sup> The Nickel Industry, Mines Branch, Ottawa, 1913, p. 6.

The best section of the Grenville is to be found on the Toronto branch of the Canadian Pacific Railway going south from Romford. The quartzites of the Sudbury series are cut off by coarse granite and gneiss two miles south of the Junction with the main line of the Canadian Pacific; beyond which for about a mile only Laurentian eruptives have been observed. Then, at a quarter of a mile north of mile 118, biotite-garnet schist, with much kyanite, is found as a dark gray fresh looking rock, evidently a sedimentary member of the Grenville series and not of eruptive origin. With some interruptions of red Laurentian granite and gneiss, similar schists continue south to the crystalline limestone, which occurs a quarter of a mile south of Mile 115.

The limestone is interbedded with amphibolite and some gneiss, the whole having a width of 85 feet, of which not more than 25 feet are pure limestone. It has a strike of 30° to 50° and a dip of 44° to the southeast. It can be followed as low ridges to the southwest and northeast for about 500 feet. No attempt has been made to look for the limestone in other parts of the region.

The crystalline limestone is pale greenish gray to neutral gray in color and of medium grain. With a lens many dark green rounded particles can be seen embedded in the calcite, and thin sections disclose green augite, a little oligoclase, small amounts of some untwinned colorless silicate, perhaps scapolite, a little quartz and small grains of brown titanite. A partial analysis made by Mr. W. K. McNeill, Provincial Assayer, shows the following composition:

Calcium carbonate .....	74.22 per cent.
Magnesium carbonate .....	trace.
Alumina and ferric oxide .....	1.30 per cent.
Insoluble .....	24.20 per cent.

The limestone is too impure to be of much value. It differs entirely from the small bands of limestone found in later formations in the region, which are not crystalline, and is closely like the typical Grenville limestones of southeastern Ontario and Quebec.

#### The Kyanite Schists

The prevalent rock of the Grenville southeast of Sudbury is schistose or gneissoid, but differs greatly from the reddish Laurentian gneiss often interbanded with it. It is generally coarse in texture and gray or greenish gray and consists mainly of biotite, muscovite, or sometimes hornblende, quartz and plagioclase, with many crystals of pale blue kyanite and often also of garnet. Prof. Walker first called my attention to the presence of kyanite in these rocks, suggesting that the original material was clayey sandstone.

A specimen obtained a little south of the crystalline limestone has been analyzed by Mr. McNeill with the following results:

Silica .....	57.30 per cent.
Alumina .....	26.03 per cent.
Ferrous oxide .....	5.24 per cent.
Ferric oxide .....	1.39 per cent.
Lime .....	3.35 per cent.
Magnesia .....	2.03 per cent.
Potash .....	3.21 per cent.
Soda .....	1.07 per cent.
Phosphorus pentoxide .....	0.14 per cent.
Water .....	0.38 per cent.
Total .....	100.14 per cent.



It will be seen that in composition this rock resembles a syenite which has been weathered and leached. Syenites usually contain from 5 to 12 per cent. of potash and soda, and less than 20 per cent. of alumina; while the kyanite gneiss contains only 4.28 per cent. of the alkalis and 26.03 per cent. of alumina. It is evidently a recrystallized sedimentary rock, but differs from the Grenville gneisses described by Dr. Adams from Quebec and eastern Ontario in some important respects, containing less silica and more alumina than any shown in his analyses, and having kyanite instead of the sillimanite which he reports.<sup>19</sup> The reason why the silicate of alumina takes the form of kyanite instead of sillimanite is probably to be found in the relative specific gravities of the two minerals, which are 3.64 for kyanite and 3.23 for sillimanite. It may be supposed that the Grenville sediments of the Sudbury region were metamorphosed under higher pressure than those of eastern Ontario and therefore the silicate of alumina took on the denser form which is kyanite.

The kyanite gneisses begin three and a half miles north of the crystalline limestone and extend for half a mile south of it, but are lost before one reaches Wanup, halfway between miles 114 and 115, where diorite penetrated by coarse red pegmatite rises from the drift along Wanapitei river.

The Toronto branch of the Canadian Northern Railway, hitherto east of the C.P.R. branch, here crosses it and runs south to the station Quartz. Near the quartz mine, which furnishes flux for the Canadian Copper Co.'s smelter at Copper Cliff, Grenville rocks of another type show themselves—fine grained, pale brownish or gray gneisses, finely banded and quite different from the pink Laurentian gneisses and pegmatite dikes near by. They are very quartzose and contain a little microcline or orthoclase and also some plagioclase, with biotite and muscovite.

The quartzite mined is very coarse grained and glassy, mostly white, but sometimes greenish and sometimes stained red with iron oxide. In thin sections it is found to consist mainly of quartz in large, clear, interlocking portions pierced by many needles or brushes of sillimanite. There are also very small amounts of muscovite and of microcline. Sections of this quartzite are entirely different in character from sections of the Wanapitei quartzite (Sudbury series) a few miles to the north, the materials having been much more completely recrystallized.<sup>20</sup>

Gneisses of the Grenville character continue south from Quartz (mile 246.5 on Can. Northern Ontario Ry.), almost to the flag station Waterfall (mile 241.9), where they give way to coarse pink quartzite like that at the quartz mine, with a breadth as crossed by the railway of 370 feet. The strike is here north and south and the dip 60° to the east. The whole of this Grenville area is intersected with dikes of very coarse white pegmatite. Beyond this only Laurentian-looking rocks are seen.

The north and south section just described has a length of 9½ miles, the northern part on the Toronto branch of the Canadian Pacific, the southern part on the Canadian Northern Ontario, after the crossing of the two railways.

A parallel section a mile or less to the east is supplied by the C.N.O.R. to the north of the crossing and the C.P.R. to the south, but the northern part has proved less interesting, since no limestone has been found and the Grenville schists seem less abundant. On the C.P.R. south of the railway crossing the diorite ends a quarter of a mile beyond mile 113, and is followed by Grenville gneiss, which continues to mile 112. Just beyond this coarse quartzite, like that at the mine, occurs interbanded with gray schist, with a strike of 20° and a dip of 45° east. The width along the railway, which cuts the ridge diagonally, is 300 feet. Garnetiferous gneiss of the Grenville type continues almost to mile 111, where the railway touches a narrow lake. One hundred paces north of mile 111 and 200 paces west of the railway coarse quartzite is once more found, with a breadth of about 50 feet. There are several pegmatite dikes of white feldspar with coarse graphic structure, the whole flecked with black mica.

<sup>19</sup> Am. Jour. Sc., Vol. L, 1895, pp. 67, etc.; Geol. Sur. Can., Vol. VIII, 1895, pp. 49 J., etc.; also Memoir No. 6 1910, pp. 173, etc.

<sup>20</sup> The Nickel Industry pp 103-4.



South of the little lake only the red-banded Laurentian gneiss with some interruptions of greenstone or diorite was found. It should be mentioned that the Grenville rocks are not continuous in the sections just given, but are penetrated by red granite and sometimes interbanded with Laurentian gneiss.

Kyanite-garnet gneiss occurs at Wanapitei, on the main line of the C.P.R., five miles northeast of the most northern outcrop of Grenville on the Toronto branch, but whether the Grenville gneisses extend farther in that direction is not known. Dr. Bell's somewhat indefinite reference to Grenville rocks in his report on the French River sheet gives the band a probable length from northeast to southwest of 30 miles. The diagonal section of  $9\frac{1}{2}$  miles examined by myself probably implies a width of 5 or 6 miles from northwest to southeast. It may be inferred that there is an area of 100 or 200 square miles of Grenville rocks, cut by much eruptive granite and pegmatite, in the region southeast of Sudbury. It would be rash to give an estimate of the thickness until much more detailed work has been done in the mapping of this ancient and tangled series of rocks.



Dam for Lower Power Plant, Wanapitei River

### The Sudbury Series

The sedimentary rocks near the town of Sudbury, underlying in places the Ramsay Lake conglomerate, were the first to suggest that a group older than the Huronian and younger than the Keewatin or Grenville existed in the region, and as these rocks have been rather carefully studied and are extensively developed they may be described first. Three petrological divisions are naturally made in these rocks, the Copper Cliff arkose being probably at the base, followed by the McKim greywacké and the Wanapitei quartzite. No basal conglomerate has been found below the Copper Cliff arkose, perhaps because later eruptives have disturbed the relations, and it should be added that Dr. Barlow believes the arkose to be younger than the greywacké and to be enclosed by it in the axis of a syncline,<sup>21</sup> but the arrangement just given is more probably correct.

In the western part of the region there are considerable areas of slate, and sometimes also comparatively thick beds of conglomerate, while at a few points thin sheets of limestone may form part of the Sudbury series; but these will be referred to later, and at present only the rocks occurring near Sudbury itself will be considered.

<sup>21</sup> Geol. Sur. Can., Vol. XIV, 1901, Part H, p. 65.

#### The Copper Cliff Arkose

Near the famous Copper Cliff mine a range of reddish hills runs from southwest to northeast, with a length of about nine miles and a greatest breadth of half a mile. They consist of fairly fresh looking material suggesting granite, and in early reports they were variously called granite, syenite or felsite. As distinct stratification is rarely seen this assumption was not unnatural. In fact, the rock is usually so massive that it is hard to determine its attitude and thickness, though it is probably steeply tilted like the well stratified greywacké which follows it to the southwest. If we assume a dip of  $45^\circ$ , which is almost certainly below the reality, its thickness will be about 2,000 feet. The band of arkose thins and is interrupted for a short distance just northeast of Copper Cliff, and along its northwestern edge certain greenstones appear to have encroached on its boundaries.

As a result of the coming in of these eruptives and of some granites nearby, the arkose has been a good deal recrystallized and in places long blades of green hornblende have been developed. In other places it has been brecciated, perhaps when the nickel-bearing eruptive spread out over it.



Greywacké, Sudbury Series

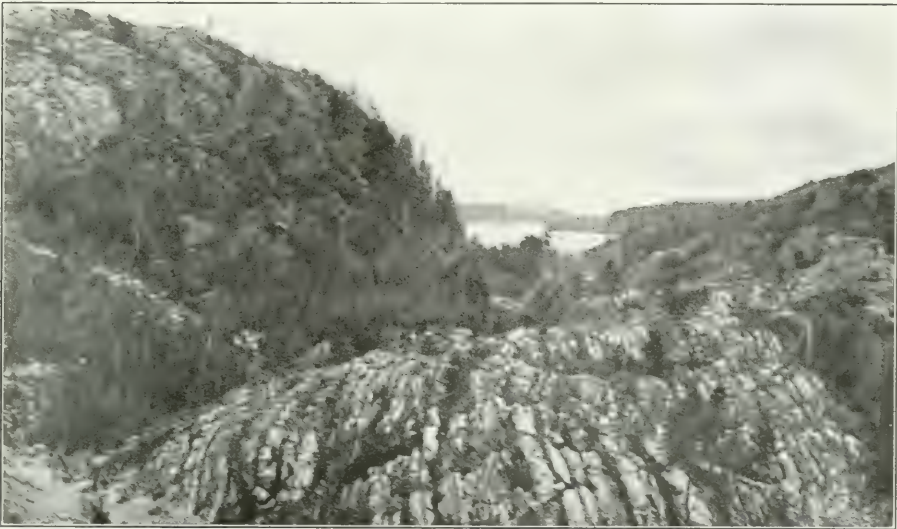
In thin sections one finds that the recrystallization has not gone so far as to destroy the fragmental character of the original grains of quartz and feldspar of which the rock was formed. The grains are not generally well rounded so that they cannot have been transported far by wind or water. There is scarcely any decay of the feldspars, and their fresh look suggests that the original granite weathered nearby under either desert or cold climate conditions. The old granite from which the materials came has not yet been found; but the arkose is cut in a few places by dikes of later granite, as, for example, on the hill beside the Copper Cliff mine.

#### The McKim Greywacké

The McKim greywacké, named for the township of which Sudbury is the centre, lies to the southeast of the arkose just described, but good contacts of the two rocks are hard to find, partly owing to the crushing and faulting caused by the nickel eruptive, so that their relations are not entirely certain. The greywacké has been much less rearranged than the arkose and presents on weathered surfaces beautiful sedimentary structures, fine stratification with small scale cross bedding and ripple marks. Its bedding is so evident that dip and strike are easily determined. The strike varies in Sudbury itself from N.  $40^\circ$  E. to east and west, and the dip is either vertical or  $75^\circ$

to 80° to the southeast. On the hills within the town limits a width of a mile may be measured and if, as is probable, the formation continues beneath the drift toward the southeast to certain hills of greywacké near the railway station, its full width is 7,500 feet and the thickness is not less than 7,000 feet. The greywacké extends from near the southeastern corner of the nickel eruptive to Naughton, a distance of 24 miles in a direction about W.S.W.

The petrographic character of greywacké is somewhat vague; and the long belt of rock just outlined varies a good deal in composition, but always has some gritty particles of quartz and feldspar in a grey ground mass of finer material. Usually the rock is banded with finer and coarser layers, the bands varying from half an inch to two or three inches in thickness, probably an indication of seasonal changes. The finer-grained parts are slaty and usually contain pseudomorphs after staurolite, sometimes small like "rice grains," but occasionally reaching 5 or 6 inches in length, with a breadth of one inch. The pseudomorphs now consist of fine-grained quartz and sericite. In thin sections one finds in the matrix a good deal of chlorite and sericite beside obscure opaque material.



Sudbury Quartzite, with Granite to left

Near Stobie there are interesting phases of the greywacké passing into coarse conglomerate in a narrow, discontinuous band not far from the base of the formation. The pebbles include granite, quartzite, greenstone and green schist.

Where the greywacké lies beside later eruptives, as near Frood and Stobie, it is often considerably metamorphosed, even passing into schist or fine-grained gneiss. Toward the southwest, as near Victoria Mine and Worthington, the greywacké proper merges into slate and also into quartzite. One band of the quartzite at Victoria mine contains 88 per cent. of silica and was mined for use as flux in the old Mond smelter.

The greywacké has phases which connect up with arkose, slate and quartzite, and more or less greywacké is found to the southwest of the long band just described.

#### The Wanapitei Quartzite

To the southeast of the band of greywacké there is a still wider band of quartzite, extending as far as the Laurentian. Its contact with the McKim greywacké is commonly hidden but may be seen on an island near the western end of Ramsay lake, and there are small bands of greywacké or of slaty material in places interstratified with



it. The quartzite has distinct bedding in rather thick layers and sometimes also cross bedding; and on weathered surfaces it looks like a pale grey sandstone.

In general the quartzite shows a strike of northeast and southwest, following the usual trend of the region, and has a dip averaging  $45^{\circ}$  to the southeast. Near the middle of Ramsay lake there is a suggestion of a small anticline, but elsewhere, e.g., along the main line and Toronto branch of the Canadian Pacific railway, it appears to have a monoclinical arrangement, sometimes locally disturbed by outcrops of later greenstone. As the width varies from 4 to 6 miles, the thickness can hardly be less than 15,000 feet, and may reach more than 20,000.

In undisturbed places thin sections of the quartzite show fairly well rounded grains, mostly of quartz but with a few bits of microcline or plagioclase. Usually the matrix consists of secondary quartz and sericite. The quartz often has undulatory extinction, showing strain, and there are examples where the grains have been crushed, causing a "mortar structure."

As one approaches the contact of the Laurentian there is more evidence of change, and close to the granite the materials are recrystallized into a schistose rock, which in thin sections is sometimes found to consist almost entirely of quartz arranged in thin elongated lamellæ. Where the quartzite is impure, resembling greywacké in composition, the metamorphosed rock is a gneiss with much quartz, feldspars of more than one kind, and sericite or mica.

The contact of the Laurentian is distinctly eruptive, often resulting in the *lit par lit* type of structure, where thin sheets of granite separate bed from bed, the whole being more or less completely transformed into gneiss.

The belt of quartzite just described has not yet been completely mapped. Toward the northeast it is found near Wanapitei river south of the lake, and it extends southwest at least to the Long Lake mine, a distance of more than 30 miles. It is probable that the massive quartzites of the Cloche mountains on the north shore of Lake Huron are an extension of the Wanapitei quartzite, more than doubling the length just given. Along the whole southeastern edge one finds granite or gneiss in eruptive contact with the quartzite.

Where most fully developed the members of the Sudbury series appear to have the following thicknesses:

Wanapitei quartzite .....	20,000 feet
McKim greywacké .....	7,000 feet
Copper Cliff arkose .....	2,000 feet
	<hr/>
	29,000 feet

The thicknesses given must be considered approximations rather than the results of carefully determined sections. The maps of the Sudbury nickel region published by the Bureau of Mines of Ontario and the Mines Branch at Ottawa show the distribution of the sediments of the Sudbury series in the vicinity of the nickel range.

### Eruptives of the Sudbury Series

Later than the sedimentary rocks just described certain bands of eruptive rocks came up as precursors of the great nickel-bearing eruptive sheet supposed to be of Keeweenawan age. These eruptives are apparently much older than the Ramsay Lake conglomerate and the Laurentian, and so may be included with the Sudbury series. Here and there among the quartzites there are a number of areas of greenstone or hornblende porphyrite, probably once belonging to the gabbro family, but, so far as studied, too much weathered to determine their original composition with certainty. These will not be described further.

A band of grey-green gabbro, less completely transformed, runs southwest from the hills east of Sudbury to Kelley lake, a distance of nine miles, with a breadth varying from a mile to less than a quarter of a mile. The band had a laccolithic character and heaves up the greywacké on each side. The freshest portions of this gabbro are



found under the microscope to consist of labradorite, enstatite and diallage, and occasionally the rock contains some pyrrhotite, suggesting a relation to the nickel-bearing norite. Curious masses of white quartz, surrounded by a hornblende albite rock, are supposed to be fragments of quartzite partly digested by the laccolith. One of these quartz masses was large enough to be mined for furnace linings at the Copper Cliff smelter.<sup>22</sup>

#### Sudburite

The most interesting of the Sudburian eruptives forms an irregular and often interrupted band along the southeast side of the nickel range, beginning at Blezard mine toward the northeast and extending to Gertrude mine on the southwest, with a length of 13 miles. Rock of the same kind is known to occur at one or two points on the northern range, and has recently been found by Mr. C. Brackenbury at the most southern of the Levack ore deposits. While not nickel-bearing itself, it seems to have been an early differentiation from the norite magma which finally spread out along the same plane and which contains the ore bodies.



Greenstone near Murray Mine, Sudbury

Where best preserved the rock is a fine-grained grey lava, with amygdaloids and pillow structure, but in many places it has been weathered to greenstone or squeezed into green schist. Thin sections of the freshest examples consist of bytownite, hypersthene and augite, with a considerable amount of magnetite. The rock contains less than 47 per cent. of silica and is distinctly more basic than the nickel-bearing norite, which contains on the average 52.77 per cent.<sup>23</sup> In former reports by the present writer it has been called "older norite," since its mineral composition is that of a very basic norite; but it is suggested by Dr. Miller that as an effusive or volcanic it should probably have a separate name. It may be called sudburite, for the region in which it was found, and it may be considered as having the same relation to norite as that of basalt to gabbro or rhyolite to granite. It differs from basalt in having no glass or olivine, and in the equidimensional character of its component minerals. The feldspars are very basic, bytownite as shown by their optical properties, and have usually very few twin planes, often only two, and they are never platy nor lath shaped as in the basalts and diabases. The very large amount of magnetite, 15 or 20 per cent., is a characteristic feature also, though this is sometimes found in basalts.

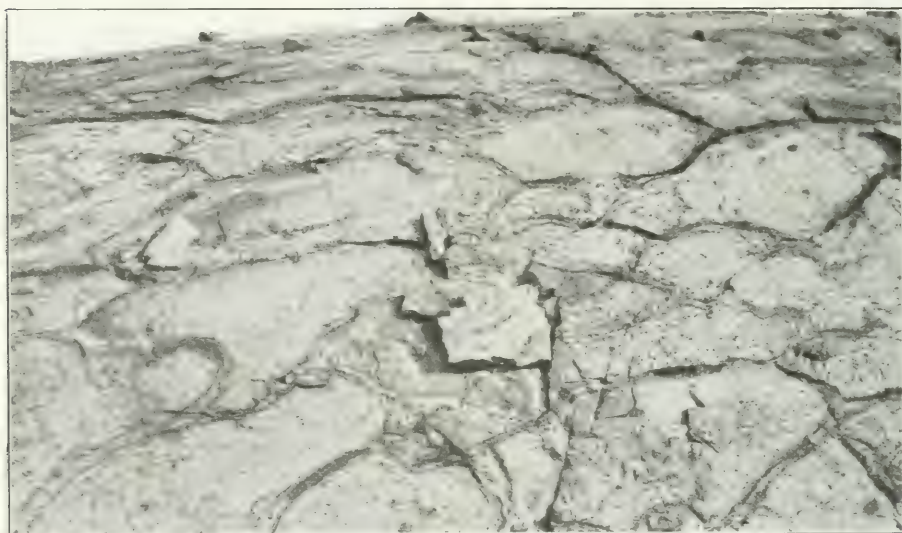
<sup>22</sup> Bur. Mines, Vol. XIV, Part III, pp. 121-3.

<sup>23</sup> The Nickel Industry, Dept. of Mines, Ottawa, 1913, p. 106.

The other dark minerals are mainly pyroxenes, more than half hypersthene (rhombic), the rest ordinary augite, the two together making up fifty per cent. of the rock. Some difficulty is met in distinguishing the two pyroxenes, since there seem to be intermediate varieties with small angles of extinction, as if hypersthene was to be considered merely augite with zero extinction angle. These intermediate forms are pleochroic. A shred or two of brown mica may sometimes be seen, suggesting a relation to the nickel-bearing norite, which generally contains biotite; but no quartz has been found in sudburite.

There are also porphyritic varieties of sudburite with large crystals of hypersthene, augite or hornblende of a poikilitic kind enclosed in the fine-grained mass. It is uncertain whether the hornblende is original or not in these porphyrites, but in many cases the sudburite may be found passing into amphibolite by weathering.

The rock found by Mr. Brackenbury, a paper by whom is published in this volume, on the northern nickel range is closely like the typical sudburite of the southern range, except that monoclinic pyroxene is present in larger amounts than the rhombic variety.



Pillow Lava, Sudburite, Elsie Mine, Sudbury

Two analyses of sudburite have been made, with results as follows:

	I	II
Silica . . . . .	46.69	46.86
Alumina . . . . .	14.23	16.94
Ferrous oxide . . . . .	12.82	15.49
Ferric oxide . . . . .	2.00	4.18
Lime . . . . .	13.32	9.65
Magnesia . . . . .	8.15	2.94
Phosphorus pentoxide . . . . .	0.19	0.28
Titanium oxide . . . . .	1.28	1.54
Potash . . . . .		0.23
Soda . . . . .	0.98	1.51
Manganese oxide . . . . .	0.11	
Sulphur . . . . .	0.12	0.09
Water . . . . .	0.08	0.47
	<hr/>	<hr/>
	99.97	100.18
Specific gravity . . . . .	3.24	

Specimen No. I is from a hill south of Murray mine, the analysis having been made by Mr. J. A. Horton in the Applied Science Department, University of Toronto; and Specimen No. II is from south of Blezard mine, about four miles to the northeast, the analysis by Mr. W. K. McNeill, Provincial Assayer, Toronto. In silica contents the two analyses are closely alike, but there are somewhat marked differences in the alkaline earths and alkalis, the rock from Murray mine having more lime and magnesia and less soda than that from Blezard mine. It is probable that the feldspar in the latter case approaches labradorite a little more closely than in No. I.

Thin sections of the rock from Murray mine are a little fresher and are probably more typical than those from Blezard mine.

### The Long Lake Region

The Wanapitei quartzite extends southwest from the region just described to Long lake, and is crossed by the road from Sudbury to the eastern end of the lake. Going south from the brickyard between Sudbury and Copper Cliff one crosses greywacké of



Long Lake Shaft House

the type previously described, a narrow band of conglomerate, no doubt basal Huronian like that of Ramsay lake, and then quartzite with a few bosses of greenstone to the end of the lake. The direction of strike is about northeast and southwest and the dips recorded are high.

Long lake is a narrow body of water nine miles in length running northeast and southwest parallel to the prevalent strike of the rocks. Its southeast shore and most of the islands in the lake are of quartzite, but there is more variety in the rocks on the northwest shore. Greenstone appears near the head of the lake and continues for three fourths of a mile, after which quartzite reappears for half a mile, followed once more by greenstone. The top of a hill, whose base is of the greenstone, is formed of greywacké conglomerate like that of Ramsay lake. Beyond this most of the northwest shore to the outlet of Long lake is of quartzite, though slate forms a low point about one-third of the way down, passing into arkose. The slate seems to underlie the quartzite, and does not correspond to the other rocks in strike, but is nearly at right angles to the usual direction (strike  $140^{\circ}$ , dip  $40^{\circ}$  to the W.). Some greenstone appears on the northwest shore before the narrows leading to the lake expansion near Long Lake mine, but the rest of the shore is mainly quartzite.



In general the rocks are much the same on Long lake as in the Sudbury section and evidently belong to the same series, with the exception of the greywacké conglomerate, which is probably Huronian.

#### Long Lake Gold Mine

A wagon road leads south from Naughton on the Sault railway, eleven miles west of Sudbury, to the Long Lake mine, a distance of about nine miles, rounding the southwest end of the lake and going a mile or two south of it. The rocks traversed as far as Long lake are quartzite, penetrated in places by greenstone, like those nearer Sudbury, and require no description. On the south side of the expanded end of the lake some slate shows itself and the rocks are much crushed and disturbed. On the road south of the lake the quartzite is still more disturbed, and is cut by dikes of coarse-grained and also of fine-grained diorite. Presently one observes that large blocks of the quartzite are enclosed in the diorite and are somewhat metamorphosed and penetrated by many small quartz veins. The mine itself is on such a mass of quartzite, a large irregular block



Long Lake Mill

enclosed in the diorite, part of it still showing bedding and cross bedding. In thin sections of the ore one finds the quartz crushed and rolled out and accompanied by some plagioclase, the whole evidently a good deal recrystallised, since no original grains can be seen.

The diorite is rather dark greenish-grey and consists mainly of plagioclase and hornblende, with some biotite, epidote and apatite. It is much fresher than the greenstone, rising as bosses through the quartzite elsewhere. The diorite near the mine varies considerably in character and has phases of a reddish color suggesting syenite.

Other masses and hills of quartzite, enclosed with diorite and syenitic-looking rock, occur for a mile to the south, where the eruptive has the appearance of Laurentian granitoid gneiss. Going east along the pole line which brings power from Wanapitei river well stratified and cross-bedded quartzite is seen for some distance, having the usual strike of  $50^\circ$  with a vertical dip, but at a mile and a half the strike has changed to  $120^\circ$  with a dip of  $60^\circ$  to the northeast, and a little beyond the strike is  $150^\circ$  with vertical dip showing the disturbance caused by the eruption of the Laurentian. Dikes of granite appear, and the quartzite is strongly metamorphosed, while a patch of greywacké is greatly squeezed and crumpled. At Wavy lake, about three miles east of the



mine, only small patches of greatly attacked quartzite remain and the coarse red granite and gneiss are characteristically Lurentian in look. The contact is typically eruptive.

The ore of the Long Lake mine is of an unusual character, consisting simply of the quartzite impregnated with mispickel, and in part also with pyrite. The mispickel is seldom in crystals visible to the eye, but is often diffused in small particles, giving a bluish tinge to the quartz. Under the microscope these dark grey particles of mispickel can be seen irregularly scattered through the quartz. The gold, which is very fine and seldom visible, is associated with the mispickel rather than the pyrite.

There are other large blocks of quartzite enclosed in diorite nearby, but they have not proved to be gold bearing.

The Long Lake mine is owned by the Canadian Exploration Company, with Mr. R. W. Brigstocke as manager, Mr. G. E. Cole as mine superintendent, and Mr. G. W. Bissett as mill superintendent. At the time of my first visit, in July, 1912, the shaft had a depth of 200 feet, and a mill had been erected and used for testing purposes, but work was shut down until electric power should be available. A power plant was then being installed on Wanapitei river and a pole line was under construction for transmission. On my second visit, a year later, the mine and mill were in operation. The original ten stamps had been increased to twenty, and the whole of the pulp was passed through the tube mills and cyanided. It was stated that eighty tons of ore were treated in the twenty-four hours, and that from \$8.00 to \$11.00 worth of gold was recovered per ton, the whole of it by cyanidation. The somewhat elaborate process, in which cyanide solution began its work in the stamp batteries and continued it through the tube mills and tanks, seemed to be working satisfactorily.

The source of the gold in this unusual variety of ore is probably to be sought in the diorite which shattered and carried off blocks of the quartzite, while magmatic solutions introduced silica, compounds of arsenic and sulphur and also gold. These materials were deposited in the small fissures and also in the pore spaces of the original sandstone which became transformed to the compact quartzite or arkose which now forms the ore. If the diorite introduced the ore one would expect that other masses of quartzite surrounded by diorite, would also prove to be gold bearing, but none have yet proved auriferous.

The relation of the diorite to the Laurentian granite is not certain, though the two seem more or less to blend toward the south and east of the mine. It is likely that the diorite is younger than the greenstone bosses in the quartzite to the north and of the same age as the Laurentian. If this is correct it might be of interest to look for other basic phases of the granite along the contact with the quartzite of the Sudbury series.

## Extensions of the Sudbury Series to the Southwest and West

### The Region of Lake Penage

The present writer has studied the westward and southwestward extension of the Sudbury series along three routes, that of lake Penage, etc., to the southwest of Long lake, that of the Algoma Eastern Railway south of Espanola, and that of the Sault branch of the Canadian Pacific extending to the original Huronian. The region of lake Penage may be taken first. For this the maps prepared by Dr. Bell are useful.<sup>24</sup> A creek flowing from the west end of Long lake passes into Round lake mostly through low ground, though some quartzite appears on its shores, while all the north shore of the lake is of the same rock. At the southeast corner of Round lake, where a narrow bay extends eastwards, conglomerate occurs enclosing pebbles of granite, quartzite and dark grey slate or schist. The conglomerate becomes more and more squeezed and rolled out as one advances east in the bay until even the granite boulders are flattened

<sup>24</sup> G. S. C., 1890-91, Sudbury Sheet, Map 18, and 1897, French River Sheet.

and the rock becomes schist conglomerate. This probably belongs to the Sudbury series, though that cannot be considered certain at present.

The outlet of Round lake southwestwards is over greenstone into a creek winding through marshes for a mile, greenstone still showing to the north, while quartzite forms the shore of a small unnamed lake into which it opens. A half mile of creek, showing no rock, leads into the large and tangled body of water named on the oldest maps Lake Penage, on Dr. Bell's map Panache. I was informed by residents that the earlier name is the correct one.

Lake Penage extends fourteen miles from the inlet to its outlet toward the southwest, but a long and wide bay stretches also for nine or ten miles to the southeast. The shore is varied by many peninsulas, and islands of all sizes break the wider parts of the lake. Following the north shore westwards for half a mile the rock exposed is conglomerate, probably Huronian, with a matrix of dark quartzitic material enclosing boulders of granite and quartzite. Quartzite with greenstone bosses extends from this to the northward bay, from which a wagon road leads to Whitefish on the Sault branch. Here some quartzite is found on each side of the bay; but conglomerate like that of Ramsay lake caps a hill two miles inland a little to the west of the road. On the west side of the bay there is schist conglomerate, probably of Sudburian age, so that two conglomerates exist separated by a great lapse of time.

A rugged promontory of greenstone projects southwestwards from the north shore a mile west of the road, penetrating quartzite which forms the shore of a bay to the north; while the west end of lake Penage presents a variety of rocks, including limestone, overlying a conglomerate containing few pebbles. Part of the limestone looks much like the Huronian limestone of Echo lake, though other parts are slaty. This forms the shore for a mile and a half before quartzite once more appears at the northwest end of the lake. At the extreme west end more limestone appears, some of it quite pure, so that one of the canoeemen compared it to that of Haileybury (Silurian). To the south is conglomerate, whose relations to the limestone are uncertain. In all there are several miles of shore formed of limestone and the accompanying slate, and the outcrops are in places half a mile wide. The attitude of these rocks is not always certain, some parts having a dip as high as  $45^\circ$ , while others seem nearly horizontal. The limestone and conglomerate, with associated slate, appear to be Huronian. A partial analysis of limestone from the northeast shore of lake Penage, made by Mr. McNeill, shows the following composition:

Calcium carbonate .....	61.85	per cent.
Magnesium carbonate .....	2.32	"
Alumina and ferric oxide .....	2.50	"
Insoluble .....	33.00	"

The south side of lake Penage was less carefully coasted, but the shore and islands consist mainly of quartzite cut by bosses and bands of greenstone, probably belonging to the Sudbury series. At a few points in the southern bays slate is found, and not far from it conglomerate. Impure limestone was seen near Bedard's gold claim, a half mile west of the boundary line between townships 83 and 75. It is within 75, and near the southern side of the township. The supposed ore body is on a point including some quartzite and spotted slate, as well as the limestone. The dump obtained from a test pit shows mispickel, pyrite, pyrrhotite and chalcopyrite, but no gold was seen. The relationships are very different from those at the Long Lake mine, where quartzite and diorite are the country rocks.

In general the shores of Penage lake consist of quartzite and greenstone of the Sudbury series, but at its west end and at a few points on the south limestone, probably Huronian, is found, and at several points conglomerate occurs, probably the basal Huronian.

#### Lakes to the South of Penage

A short river channel with a drop of six feet leads to Walker lake, as it is named by Dr. Bell. The outlet is over a low part of a ridge of greenstone, and the shores of the lake are mainly formed of quartzite, cross bedded and sometimes containing small bands of slaty material. After a narrows at the south side of Walker lake there is a small expansion of Whitefish river and then another narrows on the east leads into Bear lake. This is surrounded mainly by Sudburian quartzite including slaty layers and also narrow belts of conglomerate, the latter enclosing pebbles of quartzite, slate, black chert and limestone as well as the never failing granite. The limestone pebbles are mostly weathered out. The conglomerate rests on quartzite at one place on the north shore as one enters the lake, but in other places it seems to be interbedded with the quartzite, and its age is uncertain. At one point it has a strike of  $75^{\circ}$  and dip of  $40^{\circ}$  to the southeast, conforming to the general arrangement of the Sudburian rocks; but the limestone and quartzite pebbles suggest a post-Sudburian age unless there are rocks of this kind contained in unknown outcrops of the Keewatin or Grenville series in the region.

A lumber road to the north of the east end of Bear lake leading towards a bay of Lake Penage shows only drift except a few outcrops of greenstone.

An excursion two miles south from Bear lake to the Cloche mountains crossed the strike of the formations and showed greenstone, slate, conglomerate, slate and quartzite. There are four ridges and four depressions occupied by streams or narrow lakes before the foot of the range is reached. The mountains are formed of pure quartzite almost as white as snow where forest fires have burnt off the vegetation. The forms are rugged with steep cliffs and large, angular talus blocks at their foot. The summit climbed reached 700 feet by aneroid above Bear lake or about 1,700 feet above the sea. It was one of the highest points in the northern ridge and was separated by a narrow and deep east and west valley from a parallel ridge near Georgian bay.

Some large blocks of vitrophyre tuff like the Onaping tuff of the Animikie at Sudbury lie on the south shore of Bear lake, but the rock was not found in place. They may have been transported by ice from some outcrop beneath the waters of the lake.

### Section on the Algoma Eastern Railway

#### South of Espanola

The recently constructed branch of the Algoma Eastern railway running south from Espanola to Little Current provides the best cross section of the Sudbury series west of the Toronto branch of the Canadian Pacific. Just south of Espanola station on the Sault branch and between it and the village an east and west ridge of quartzite with a few included pebbles and boulders is of uncertain age. It shows no distinct stratification and may be a quartzitic phase of the Huronian. At the Falls of Spanish river which supplies power for the pulp mill coarse diorite is to be seen. For three miles south of Espanola the railway crosses a sand plain, then bends to the east to pass round a striking cliff of rock, which here consists of greenstone. One hundred and fifty paces to the east near mile 50 the cliff is found to consist of quartzite capped unconformably by a sheet of conglomerate, which can be followed for 630 paces eastwards. The quartzite has a strike of  $65^{\circ}$  and a dip of  $40^{\circ}$  to the southeast. In most places the surface is irregular as it passes under the conglomerate forming the plateau-like top of the hill, but at one point the conglomerate rests on a smooth surface of quartzite dipping  $15^{\circ}$  W.S.W. The conglomerate is like that of Ramsay lake and is probably the basal tillite of the Huronian. It must cover a large area since it is found once more on a hill top about a mile to the west of the bend of the railway.

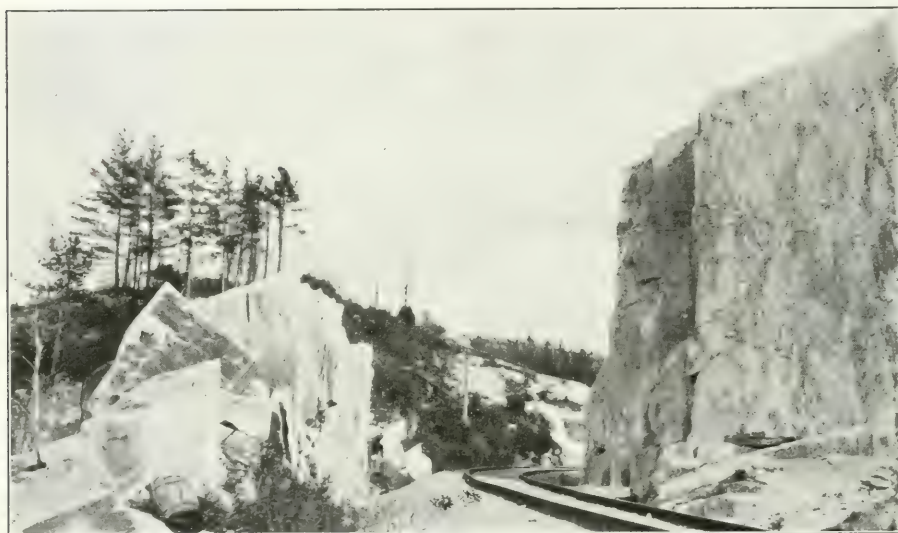
Continuing eastwards on the railway a large dike of some basic eruptive is followed for a quarter of a mile, when quartzite appears again, having a strike of  $80^{\circ}$  and a dip of  $70^{\circ}$  to the south at mile 51. Conglomerate is exposed for the next quarter



of a mile and then some impure limestone with slate and interbedded conglomerate for half a mile, all probably of Huronian age. Farther to the south quartzite interbedded with green schist and some slate extends to mile 56, beyond which there is half a mile of conglomerate resembling tillite, probably belonging to the Huronian. From this to mile 63 quartzite predominates, some green schist and slate and one or two bands of conglomerate being interbedded with it, the whole having rather high dips, occasionally reaching the vertical. They are all supposed to be Sudburian in age.

Quartzite of the same character with less of the other rocks interbedded extends from this point to Whitefish river near its exit into the Bay of Islands on Lake Huron. The last two and three quarter miles are through steep ridges of white quartzite, the westward extension of the Cloche mountains mentioned in the section south of Bear lake.

Here the railway bends southwest and passes through varied rocks, mainly quartzite, but including arkose or greywacké, and green slaty schist, all steeply tilted and



Quartzite near Whitefish, A. E. Railway

penetrated by dikes and masses of diabase. Beyond mile 67 there is a band of conglomerate interbedded with slaty rock 400 paces wide, with a vertical dip in one place, though elsewhere the bedding is uncertain. The matrix is dark green and encloses gray and red granite pebbles, no quartzite pebbles having been observed. The conglomerate is thought to belong to the Sudbury series. Farther to the southwest as far as mile 72, where Ordovician sediments begin, the rocks are mainly quartzite and reddish arkose with steep dips, penetrated by masses of greenstone.

Some large boulders of vitrophyre tuff were found a little beyond this, but none of the rock was observed in place. This point is 13 miles southwest of Bear lake where similar boulders occur; and 30 miles southwest of the Onaping tuff of the Sudbury nickel basin.

#### Rocks Near Killarney

The quartzites north of Lake Huron are mapped by Dr. Bell as a canoe-shaped trough with the two sides converging four miles and a half east of the mouth of Whitefish river. Between the two converging belts of hills called the Cloche mountains there is low ground occupied by varied rocks of lower hardness, partly quartzite and partly arkose, greywacké, green schist and conglomerate. The shore of Lake Huron is here



fringed with innumerable peninsulas and islands separated by narrow channels, one of them passing Swift Current and leading eastwards to the north end of Georgian Bay. The southern branch of the Cloche mountains runs southwest from its junction with the east and west range previously described and forks into three long, narrow and high peninsulas. Lansdowne channel separates the southern fork from some ridge-like islands and provides a route from the village of Swift Current to Killarney.

Killarney bay seems to have been hollowed out of the softer Sudburian rocks, the resistant quartzites rising as ridges above it. At the northeast end of the bay on the southwest side, coarse and also fine grained red granite lies at the foot of a steep hill of quartzite having an eruptive contact with schist and greywacké fringing the bottom of the hill. The granite which encloses fragments of these rocks is part of what Dr. Bell calls the Killarney belt, which he represents, no doubt correctly, as later than the quartzites. He states that toward each side "the grain of the rock begins to assume a sort of parallelism or a gneissoid structure," but he seems inclined to keep it



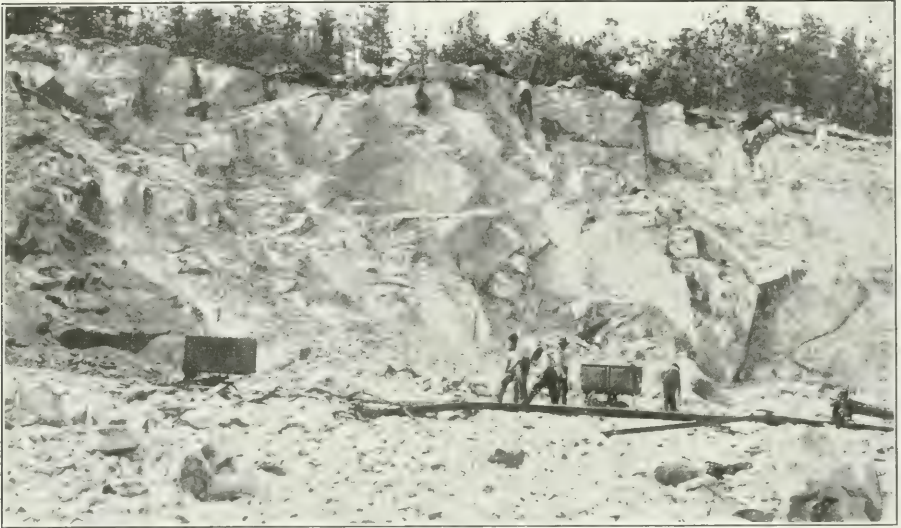
Quartzite Quarry, near Killarney

separate from the Laurentian, probably because he believed the Laurentian to be older than the Huronian. He accounts for the picking up of fragments by the granite as the result of faulting, and considers the contact as due to a great fault along the south-east side of the region here described as belonging to the Sudbury series.<sup>25</sup> With our present knowledge of the eruptive relation of the Laurentian to the Sudbury series it is more natural to include the Killarney granite with the Laurentian.

The quartzite of this branch of the Cloche mountains rises 860 feet above Lake Huron (aneroid) or about 1440 feet above the sea, giving a magnificent view of the bays and islands. On the highest point the quartzite strikes about east and west with a dip of 70° north, which accords with Dr. Bell's idea of a synclinal arrangement. The quartzite is white and appears to be extremely pure. On the northwest shore of Killarney bay it is being quarried and shipped to Welland for use in making ferro-silicon. Mr. R. Turnbull of Welland, Ont., states that the quartzite runs from 98 to 99 per cent. silica, and that Electric Metals Co., Limited, received about 12,000 tons in 1913. The quarry is owned by Mr. A. B. Willmott, Toronto. But for the expense of crushing this very pure silica should be useful in glass making.

<sup>25</sup> G. S. C., Vol. IX, 1896, pp. 6-9, 1.

It is stated that the Canadian Copper Co. have taken up a large area of quartzite for flux near Whitefish river on the northern ridge of the syncline, which seems equally pure. The amount of this quartzite is to be measured by the cubic mile, so that it may be considered inexhaustible.



Quartzite Quarry, near Killarney

### Gold Prospects Near the Outlet of Whitefish River

Several locations have been taken up for gold near the mouth of Whitefish river in the belt of quartzites just referred to as forming the northern range of hills. They are mainly along Howery creek and Charlton lake a few miles to the east of the railway, and the country rock is either quartzite or slate, penetrated in places by gabbro. The stratified rocks strike about east and west and have a vertical dip, and the quartz veins are in general parallel to the strike.

On the Murdock location (in Timber berth No. 11) a band of rusty quartz six feet wide has been stripped for 25 yards and a shallow pit has been sunk upon the deposit. Pyrite occurs and the rock is said to assay \$12.00 per ton in gold. At Miller bay, half a mile to the south, there is a vein five feet wide containing a good deal of mispickel, and the ore is said to run \$9.00 per ton. The country rock is greenish quartzite, with slate to the south. The Lehay location a mile and a half east of the one just mentioned is on the north bank of Howery creek, the vein occurring on top of a steep range of quartzite rising 190 feet above the water. There are many small veins and stringers of rusty quartz in the quartzite, said to have yielded free gold. It is of interest to find mispickel in these ores contained in quartzite 30 miles south of west from Long Lake mine, though no definite relations to an eruptive rock were found unless the gabbro mass on the Murdock location is the source of the ore.

### Westward Extension of the Sudbury Series Along the Sault Railway

The sedimentary rocks of the Sudbury series have a general strike of about 70° east of north and west of south; and this influences all the physical features of the region so that rivers, lakes and valleys and often also roads and railways trend in the same direction. On that account the Sault branch of the Canadian Pacific railway provides no good sections and shows much less variety of rocks than the routes just described. There are, however, certain interesting changes to be noted as one goes

west, especially the increasing metamorphism of the sediments as one approaches the northern contact of the Laurentian; and the relationship of the Sudbury series to the Huronian can, of course, be solved only by following it up to the typical Huronian region.

The Sudbury rocks continue without great change along the southern nickel range to Worthington and farther west, and need no detailed description. Except for a larger amount of slate they differ little from those already described. When one passes Espanola, south of which the last section was worked out, one finds the slate transformed to phyllite, interbedded with quartzite, and what were impure sandstones are changed to quartz mica schist with a surface glistening in the sun, only the purer sandstones retaining the appearance of quartzite. The quartz mica schist rises as steep ridges north of Webbwood, with purer pale greenish quartzite beyond, followed by the schistose variety at the old Shakespeare gold mine.

The quartz schist at Shakespeare mine drops suddenly toward the north to a valley floored with drift, beyond which rises a range of red granite hills with summits reaching 330 feet above the valley. The granite is coarse grained and not gneissoid,



View over Georgian Bay from Top of Cloche Mountains

though it contains masses of greenstone and is penetrated by numerous pegmatite dikes. The actual contact of the granite with the Sudbury series is hidden beneath the drift.

Going farther west the schistose character of the sediments is more pronounced near Massey and Walford, and there are places where the Laurentian is found in eruptive contact with the quartz schist, as near the Massey copper mine.<sup>20</sup> Some of the mica schists here are finely and uniformly crumpled. At Walford the glistening mica schist encloses garnets and knotty looking masses of epidote. The rock consists of mucovite and biotite with an equal amount of completely recrystallized quartz. There are bands of green hornblende schist enclosed in the mica schist probably representing the rearrangement of the basic dikes. If these were found in other surroundings they would be considered Keewatin. All the rocks are steeply tilted and highly metamorphosed by the neighboring Laurentian or by a broad dike of coarse granite which cuts the quartz mica schists.

<sup>20</sup> Details may be found in reports on the Massey and Hermina mines, Bur. Mines, Vol. XXIII, Part I, pp. 155-9.



Following the railway west to Spanish, the next village, at the mouth of Spanish river, there is not much change in the rocks, but a road north from the village shows hornblende schist and mica schist resembling gneiss as the Laurentian contact is approached. Three quarters of a mile north there are a few pegmatite veins in the schist, and 100 yards beyond this contorted bands of schist are found entangled in coarse granite.

At the next station, Cutler, on the north shore of Lake Huron, there are large masses of quartzite showing stratification but greatly bent and folded and cut by dikes of granite and pegmatite. The quartzite must have been more nearly pure quartz than the rock which formed the schists to the east, some of which look much like the western Couchiching. A mile or two west of Cutler, near the flag station Kenabutch, the sediments have almost entirely foundered in the Laurentian magma forming a well banded gneiss, but four miles west a large mass of schist in the typical Laurentian has one part much metamorphosed, while another part still retains its stratification and even pseudomorphs after staurolite. The original rock must have been greywacké.



Sudbury Quartzite and Schist, near Granite, Cutler

At Serpent river the schists occur once more without granite, but toward the north are interrupted in places by greenstone or diorite. Two miles beyond there is gray chloritic slate with the normal strike of  $70^\circ$  and a vertical dip, but half a mile to the west this becomes more schistose and passes into green schist like certain Keewatin rocks of the west. This continues for a mile beyond Spragge, the next station, when it is followed by slate and quartzite or arkose containing pebbles of granite. The relations here are uncertain, and it is possible that these rocks may be Huronian, since they seem unlike the Sudbury series. The fact that they stand nearly vertical is, however, against placing them in the Huronian. Similar rocks of uncertain age, sometimes including gray and red slate and occasionally forming a conglomerate crowded with boulders of granite, extend to within a mile of Algoma.

To the north of the railway at this village, gray, well stratified and cross bedded quartzite is found, having a strike of  $70^\circ$  and a dip of  $75^\circ$  to the southeast, closely resembling the Sudbury quartzite. A little to the south of the railway there is a small exposure of conglomerate, like that of Ramsay lake, enclosing pebbles and boulders of granite, gneiss, quartzite, slate and some rusty weathering carbonate. The matrix



is of greywacké and the pebbles are angular, subangular or rounded as in tillite. Unfortunately the relations between this tillite and the steeply tilted quartzite to the north are not certain. For a few feet near a bridge the two rocks come together, but the contact seems vertical and may be due to faulting. Along the trunk road running west the almost vertical quartzite can be followed for half a mile, in some places with a width of more than 1,000 feet; and a mile and a half along the railway one finds a similar quartzite with some green slate layers and in one place a few inches of banded white and black chert, suggesting iron formation.

After a short interruption, covered with drift, chloritic slate or schist appears to the south of the railway and conglomerate to the north, the latter slaty with granite pebbles. From this point to Blind river there is much drift with but few outcrops of rock, mostly quartzite steeply tilted and cut by greenstone. Two miles east of Blind river a little pink quartzite or arkose is seen and in the village there is massively bedded gray quartzite with a strike of  $65^{\circ}$  and a dip of  $60^{\circ}$  to the southeast. Thus far the rocks, except the conglomerates, have quite the character of the Sudbury series, and continue persistently the strike of about  $70^{\circ}$  and the steep or vertical dip. This brings us to the area mapped by Murray as Lower Slate Conglomerate.

In the western part of the village of Blind River there is an outcrop of white quartzite, very different from the gray well stratified quartzites thus far described. No stratification was noted, though the quartzite contains some black chert pebbles. Unfortunately for some distance west the railway runs through drift and greenstone, with only one or two small outcrops of white quartzite having uncertain stratification. Five miles west of Blind River, after passing Mississagi river, there is greatly squeezed conglomerate for 150 paces, and then drift again, followed by red granite or syenite, mapped by Murray as Laurentian.

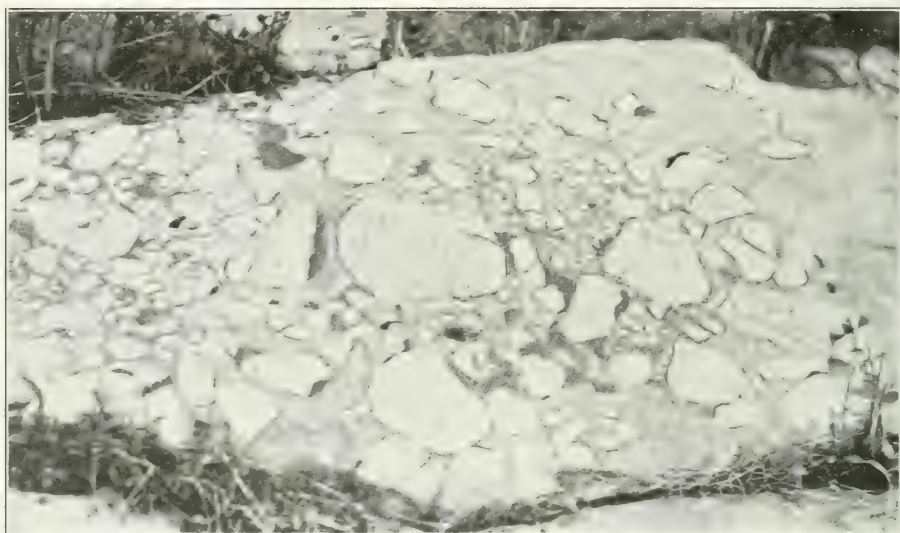
#### Relations to the Laurentian

From the notes just given it will be seen that the area represented as Lower Slate Conglomerate west of Blind river is far from being continuous conglomerate. To test the matter further some field work was done near Dean lake, where good roads lead to settlements inland. Between Mississagi river and Dean lake the railway passes a variety of rocks, in addition to the granite just mentioned. West of mile 61 (from Webbwood, the divisional point), reddish gray fine-grained arkose occurs, striking southeast and with a dip of  $30^{\circ}$  to the southwest, differing greatly from the steeply dipping quartzites, with a strike of  $70^{\circ}$  farther to the east. To the south there is slate and then drift, followed by granite. At mile 63 there is slate with the same strike but nearly vertical dip; and three-quarters of a mile beyond a slaty rock, containing a few pebbles of granite. A little past mile 64 there is characteristic slate conglomerate, containing granite pebbles and some large boulders, and this continues most of the way to Dean Lake station, about three-quarters of a mile, where the granite crops out a little to the south. Several hours of careful search showed no actual contact of the conglomerate with the granite, though the impression was left that the conglomerate and slate are much younger than the Laurentian, and that the conglomerate has been formed of materials derived from the granite. In one or two places the conglomerate is cut by a basic eruptive and in one place by a reddish fine-grained rock like felsite, but no granite dikes were observed in the Huronian.

A road leading north from Dean Lake station crosses at 300 paces an outcrop of conglomerate 100 paces wide; at 700 paces there is red quartzite dipping  $60^{\circ}$  to the southwest; at 1,000, greenstone, and west of 1,860 paces, impure limestone, with slaty layers, having a strike of  $115^{\circ}$  and a dip of  $30^{\circ}$  southwest. At a mile and a half slate is found with a strike of  $120^{\circ}$  and nearly vertical dip, followed after 150 paces by nearly flat slate conglomerate, which continues, except for a patch of greenstone, almost to the Iron Bridge across Mississagi river, a breadth of nearly a quarter of a mile. Along the river there are stratified clays, but farther to the north hills rise showing a variety of rocks. A little northwest of the bridge a dome-shaped hill consists of

conglomerate in the lower part, capped by red quartzite or arkose. The conglomerate at this and other points to the north contains many pebbles and boulders, some reaching diameters of three to six feet, the largest being of granite, though greenstone, banded jasper, black chert, slate and quartzite also occur. The red quartzite rests on the conglomerate, with a dip of  $5^{\circ}$  to the south, and for some miles to the north of this there are arkose, slate, white quartzite and conglomerates with very gentle dips toward the west or south, the highest recorded being  $20^{\circ}$ .

The considerable amount of conglomerate may be held to justify the mapping of most of the region as slate conglomerate; but it is evident that there are two series of rocks, separated by a basal conglomerate, along Mississagi river and to the south. The part with gentle dips is undoubtedly Huronian, but the steeply dipping quartzite and slate must be far older, and should not be included in the same series as the flat-lying conglomerate containing pebbles of the quartzite and slate. The rock found nearest to the granite is the conglomerate, suggesting that it rests basally on the Laurentian and other old rocks, including the Keewatin and the Sudburian.



Basal Huronian Conglomerate. Islands east of Thessalon

### The Basal Huronian Conglomerate

Going westward from Dean Lake on the railway one encounters mainly granite and gneiss, with inclusions of greenstone and green schist, like the western Keewatin, rising out of old lake deposits and swamps. For fifteen miles one follows lengthwise the area mapped as Laurentian by Logan and Murray. About three miles east of Thessalon station boulder conglomerate is found in low hills rising from a swamp to the south close to the Laurentian gneiss, and made up chiefly of Laurentian materials. It has the same characters as the often described basal conglomerate on some small islands four miles east of Thessalon harbor, and is no doubt continuous with it. Beyond the basal conglomerate come the amygdaloidal rocks, placed by Logan as No. 2 of the Huronian, but now generally held to be of Keewatin age.

As it has been proved on the islands east of Thessalon that Logan's lowest Huronian, the "grey quartzite," rests upon the basal conglomerate just mentioned, it is entirely probable that the conglomerate found near the granite just north and east of Dean lake is of the same age and that much of the "lower slate conglomerate" put by Logan and Murray above the "grey quartzite," the "green chloritic slate" and

the "white quartzite" is really basal. Probably part or all of the lowest quartzite, however, is much older, in fact pre-Laurentian and a part of the Sudbury series.

From the brief account of the rocks near Dean lake it will be seen that the geology of the Huronian region is far less simple than the map represents it, and a detailed survey of the region under modern conditions is very desirable. That there is an actual basal conglomerate beneath the Huronian sediments at two points in the typical region has been proved by Irving, Van Hise and Leith, and others; and that such a conglomerate probably rests on the Laurentian and also on steeply tilted quartzite and slate near Dean lake is shown above. If the Thessalon lavas are removed from the Huronian and placed either in the Keewatin or Sudbury series, the Lower Huronian conglomerate of Logan and Murray is brought into line with the suggestions just made, and where it has been correctly mapped it is probably identical with the basal conglomerate referred to above. A glance at the map of the typical Huronian shows how frequently the "lower slate conglomerate" is in contact with the Laurentian or with greenstone or "green chloritic slate," probably of Keewatin age. So far as my observations go this is not due to faulting as suggested by Logan, but represents a great unconformity of the conglomerate upon older rocks. Where "gray quartzite" or "white quartzite" are found beneath this conglomerate they are really far older than the Huronian and are to be reckoned as of Sudburian age.

It might be suggested that since outcrops of these lower sediments were mapped as parts of the Huronian they should still be included in that series; but it is evident from the letterpress of the geology of Canada in 1863 and the sections shown in the atlas that Logan himself considered the Huronian much later than the Laurentian. That he was puzzled by some of these areas of older rock is shown by the statement that "what is supposed to be the lowest Huronian mass . . . consists of a grey quartzite which abuts against one mass of gneiss and runs under another, and appears to be much broken by and entangled among the intrusive rock."<sup>21</sup> This grey quartzite is really Sudburian in age.

It may be mentioned that another outcrop of the basal conglomerate occurs about nine miles north of Sault Ste. Marie, in the township of Aweres, beyond the band of Huronian shown on the map. About seven miles north of the city, on the Great Northern road, coarse red granite shows at Granite station on the Algoma Northern Railway, near which it has been quarried. The same rock, followed by well-banded gneiss, extends for a mile or two beyond this, as seen along a lumber road near Trout and Birch lakes, and encloses a small band of iron formation, consisting of banded grey silica and magnetite, on which a few test pits have been sunk. Two hundred yards north of the iron range, but separated from it by drift, a wide band of conglomerate begins with a matrix of coarse granitic materials enclosing granite pebbles and boulders, much like the basal conglomerate east of Thessalon. Though it has not been seen in contact with the Laurentian it is less than 250 yards from it and is composed almost entirely of fragments derived from the granite. Conglomerate and quartzite extend for a mile and a quarter to the north, beyond which the road was not followed. It can hardly be doubted that careful field work will disclose other localities where the basal conglomerate either rests on the old rocks or is composed so largely of their debris as to make its basal character certain.

To include two pre-Laurentian series, such as the Keewatin and Sudburian, in the Huronian merely because small areas of them failed to be separated in the early work done under unfavorable conditions is quite unjustifiable. The longest known gap in Canadian geology intervenes between the Sudbury series and the Huronian, a gap which included the elevation of great mountain chains and their complete destruction, leaving only a peneplain. To put together as one series pre-Laurentian and post-Laurentian rocks is to rob pre-Cambrian classification of all significance.

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<sup>21</sup> Geol. Can., 1863, p. 55.



### Other Areas Probably of Sudburian Age

The region just described includes much the largest known area of sedimentary rocks later than the Keewatin and Grenville but earlier than the Laurentian upheaval, but rocks apparently of the same age are found in many other parts of the Canadian pre-Cambrian. Those that have been most carefully worked out belong to the Temiskaming series, first recognized near Cobalt by Miller and Knight, but since extended by these geologists with Burrows and others to the Gowganda, Larder lake and Porcupine regions. Their extent is shown on the general map of the Sudbury-Cobalt-Porcupine region, published in 1913.<sup>28</sup> A good summary of the characters of these rocks and of their relations is given in the recent reprint of the Cobalt Report.<sup>29</sup> The description of these steeply tilted sediments, sometimes thousands of feet thick, corresponds exactly with what has been said of the Sudbury series, except that the granites upturning and penetrating them are called Lorrain instead of Laurentian. In the rocks themselves the main difference is in the larger proportion of conglomerates. The Temis-



Quartzite and Greywacke, Timiskaming Series, Porcupine

kaming series is so well, though concisely, defined in this report that no further reference to the subject is needed here.

Not far from the Larder lake area, but in the province of Quebec, Morley Wilson has defined the Pontiac series in a way suggesting that it is of the same age, though the absence of quartzite makes the correlation less certain, the sediments consisting of conglomerate and arkose, generally sheared and passing into mica schist.<sup>30</sup>

The Matagami series described by Bancroft farther to the north in Quebec is probably the equivalent of the Pontiac series, and may be placed in the same position.<sup>31</sup> If this is correct the Sudburian rocks extend for 260 miles northeast of the Sudbury region, and it may be expected that future work will bring to light large or small outcrops at intermediate points between these rather widely scattered areas. That outcrops of schist conglomerate containing Keewatin pebbles and caught in the Laurentian uplift occur at numerous points where the rocks have been mapped as Keewatin or Huronian is certain, and sometimes isolated patches of the kind may be found enclosed

<sup>28</sup> To accompany Part I, XXII Report, Ontario Bureau of Mines.

<sup>29</sup> Part II, XIX Report, Ontario Bureau of Mines, 4th ed., 1913, pp. 62-69.

<sup>30</sup> Sum. Rep. Geol. Sur. Can., 1911, pp. 274-6.

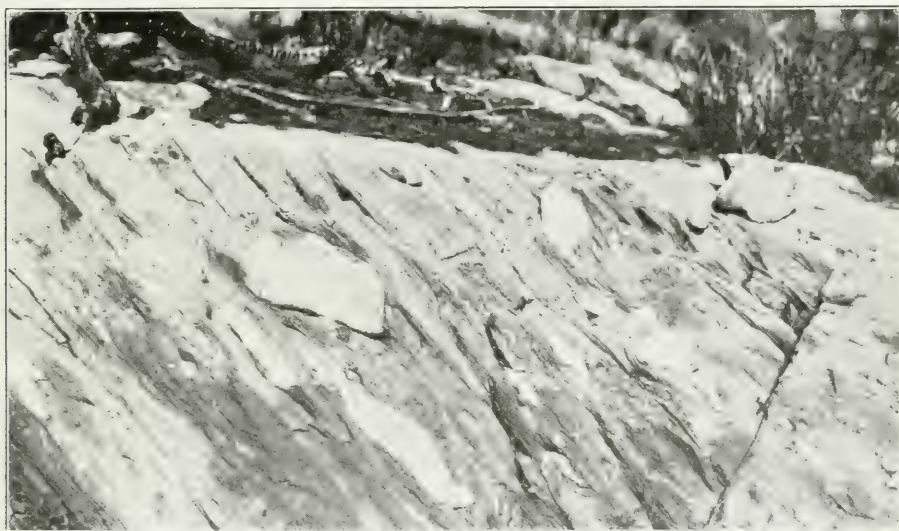
<sup>31</sup> Dept. Mines, Que., 1912, pp. 157-163.



in the Laurentian itself. North of Sudbury, near Clear lake, a mile or two beyond the northern nickel range, there is such a patch, and there are instances in the township of Hutton and northwest of it.

Sudburian rocks occur also on a fairly large scale near Whiskey lake, twenty miles north of Spanish river and separated from the southern rocks of the series by a wide band of Laurentian.<sup>32</sup>

To the northwest of the Sudbury region there is, so far as known, a long interval of Laurentian granite and gneiss before rocks of Sudburian age are encountered. One hundred and fifty miles away, at Doré river in the Michipicoten district, schist conglomerate containing pebbles of Keewatin iron range rocks and caught with the Keewatin in synclines between batholiths of the Laurentian extend along the shore of Lake Superior for fourteen miles and then bend north and finally west with a length of more than thirty miles. The Doré conglomerate was called Huronian by Logan, but the evidence given in former pages, showing that the typical Huronian is later than the Laurentian, makes it necessary to place the Doré rocks in the next lower series, the Sudburian.<sup>33</sup>



Conglomerate, Timiskaming Series, Porcupine

Seventy miles farther northwest, at Heron bay on the north shore of lake Superior, there is a similar band of conglomerate older than the Laurentian;<sup>34</sup> and on the Slate islands, south of Jackfish bay, schist conglomerate containing jasper pebbles is interfolded with the band of iron formation which supplied them. It is older than the Laurentian uplift, but younger than the Keewatin and hence of Sudburian age.<sup>35</sup>

On the east shore of Lake Nipigon at Poplar lodge, sixty miles northwest of Jackfish, a band of pre-Laurentian conglomerate with jasper pebbles has been followed fifteen miles, parallel to the iron ranges of the region. It is associated with phyllite and arkose, but not quartzite, and has a width in places of a third of a mile.<sup>36</sup> E. S. Moore has found similar rocks near the Onaman iron range farther to the north.<sup>36a</sup>

<sup>32</sup> Bur. Mines, Vol. XXI, Part I, pp. 146, etc.

<sup>33</sup> Geol. Can., 1863, pp. 53-4; also Bur. Mines, Vol. XI, pp. 162, etc.; and Vol. XIV, J. M. Bell, pp. 349-6.

<sup>34</sup> Bur. Mines, Vol. VIII, Part II, p. 167.

<sup>35</sup> Ibid., Vol. XI, p. 137.

<sup>36</sup> Ibid., XVII, pp. 142-3. <sup>36a</sup> Ibid., pp. 183-4.

It may be said in a general way that almost all of the areas mapped as Keewatin or Huronian in northern Ontario include to a greater or less extent such schist conglomerates younger than the Keewatin and older than the Laurentian.

West of Lake Superior, rocks probably equivalent to the Sudbury series extend in long bands near Seine river, and have been called by Lawson the Seine river series. They are, however, 200 miles from the nearest Sudburian rocks mentioned above, so that their equivalence is not so certain.<sup>37</sup> If these are admitted the similar conglomerates at Rat Root bay and near Lake Manitou to the north must be considered Sudburian also. After personal examination of the outcrops it may be stated that these schist conglomerates and associated sediments are like those referred to the Sudburian in eastern localities. They are later rocks than the Keewatin and have been uplifted and folded by granites and gneisses mapped as Laurentian.

That rocks with similar relations occur much farther to the north has been shown by Dowling near Red lake (lat. 51°, long. 93°-94°), where quartzite, slate and limestone occur with a conglomerate containing jasper pebbles, all being penetrated by granite, presumably Laurentian in age.<sup>38</sup>

All of the groups of rock referred to have important features in common, they are sediments, mostly coarse in nature, they are later than the Keewatin, and they have been upreared and more or less metamorphosed by great out-breaks of granite having the characters of the Laurentian. Usually they have been completely lifted from their foundations, though Lawson describes the Seine series as still in place on an ancient weathered surface near Mine Centre.<sup>39</sup>

If the whole of the areas just mentioned are of the same age, which is highly probable, there was at the end of the Sudbury time a great belt of conglomerates, greywackés, slates, arkoses and sandstones stretching for 700 miles from east to west and in places at least 260 miles wide. These were domed or tilted into mountain ranges by the Laurentian upheaval; and the greater part of them were destroyed during the slow removal of the Laurentian mountains. At present only remnants are preserved where deeply sunken into the Laurentian magma.

### Extent and Character of the Huronian Basal Conglomerate

The separation of the Sudbury series from the Huronian as previously defined depends mainly on the tracing of the basal conglomerate which has been described as overlying the Laurentian and the upturned Sudburian sediments at several points. It will be useful to run over the localities and show how complete the evidence is.

Though the section given by Logan puts the "Lower Slate conglomerate" fourth in succession above the base, i.e., above the Laurentian, there is reason to believe that this is an error. The "green chlorite slate" put second in the series, has been shown to be older than the Huronian, probably Keewatin; the "gray quartzite," the first in Logan's list, undoubtedly rests upon the basal conglomerate on the islands east of Thessalon and so is later in age; while the "white quartzite" as seen by myself near Dean lake is almost certainly older than the conglomerate, so much older that it must be put in a more ancient series, the Sudbury series. With these explanations we may consider the lower conglomerate as the basal member of the Huronian. It has been found resting on the Laurentian and made up chiefly of Laurentian debris at the following points in the Original Huronian region: On islands four miles east of Thessalon, south of the railway three miles east of Thessalon station, and on a hill half a mile north of the road between Sault Ste. Marie and Garden river. It probably has the same relations seven or eight miles north of the Sault and also east of Dean Lake station where the two rocks occur near together, though actual contacts have not been found.

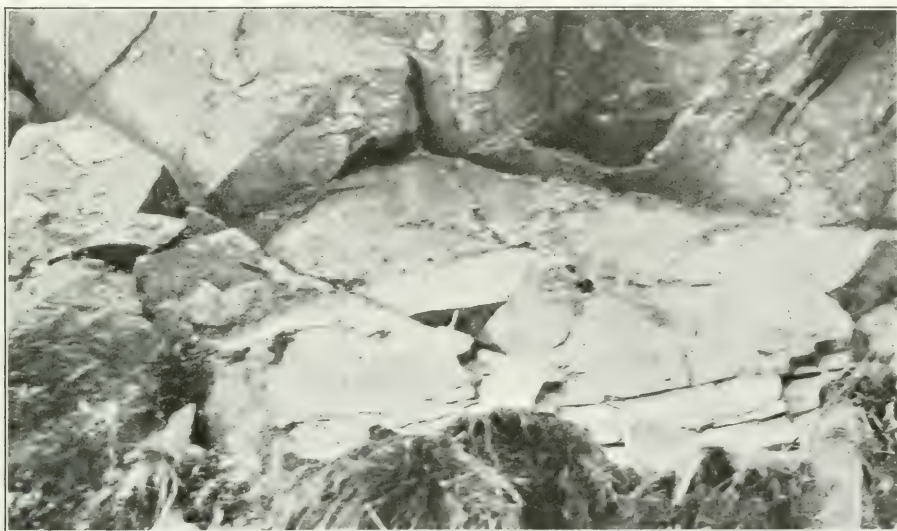
<sup>37</sup> G. S. C., Sum. Rep., 1911, pp. 241-2; also Guide Book No. 8, Geol. Congress, p. 58.

<sup>38</sup> G. S. C., Vol. VII, 1894, pp. 47 F.

<sup>39</sup> Geo. Congress, Guide Book No. 8, p. 58.

A little farther east near the Sault railway what is believed to be the same basal conglomerate has been found from point to point resting on the upturned rocks of the Sudbury series. The first occurrence, south of the railway at Algoma, does not show the relationships clearly, though the conglomerate includes pebbles of quartzite like the steeply tilted Sudburian quartzite close by. South of Walford on the north shore of Spanish river hills of conglomerate with quartzite pebbles rest on tilted quartzite for half a mile; and similar conglomerate with quartzitic matrix and sparsely scattered boulders and pebbles is found on hills just south of Espanola station. Three miles south of the town of Espanola near the Algoma Eastern railway a greywacké conglomerate rests with a well-marked unconformity on Sudburian quartzite. The contact is continuous for a third of a mile and what appears to be the same conglomerate occurs a mile west at several points for two miles to the southwest.

A few miles to the east on Lake Penage conglomerate areas occur at the west end and at various points on the north shore; as well as on the south shore of Round lake, the next to the east. The same type of conglomerate runs for more than a mile east of Ramsay lake and also forms an area of more than a square mile on its north side,



Smooth surface of Quartzite under Tillite, north of Ramsay Lake

showing in several places a striking discordance with the tilted quartzite beneath, which has a smooth surface. Nine miles east of the Ramsay lake area a band of conglomerate runs northeast for several miles, and similar conglomerates have been shown by Collins to continue to Gowganda and to Cobalt, where the famous silver bearing conglomerate is pretty certainly of the same age.

The basal conglomerates in these localities have many features in common though the matrix varies, as would be expected, with the character of the rocks beneath, being arkose above granite or gneiss and greywacké or quartzite above other rocks. There are always several kinds of rocks enclosed, invariably granite boulders, even when several miles from any granite outcrop, and almost invariably greenstones or green schist and also banded silica and iron ore from the Keewatin, as well as quartzite, greywacké or slate from the Sudbury series. Usually the pebbles and boulders vary from angular to subangular and well rounded; and in most places a little search will show boulders with diameters of one or two feet, larger than flowing water would readily transport, while in several places boulders with diameters of from four to eleven feet may be seen.



On the other hand, there is great diversity in the proportion of boulders to the matrix, some of the conglomerates being made up mainly of large and small fragments crowded together, while others have the boulders very sparsely scattered. Well marked bedding is seldom found in the actual basal conglomerate but stratified materials are often found just above it or intercalated between two sheets of the conglomerate. The features mentioned are characteristic of tillite.

In a number of places the conglomerate rests on rock which was evidently weathered *in situ*; but in at least five places the underlying rock surface is clean swept and smooth or gently rounded. Examples of the latter are seen south of Espanola, on the north shore of Ramsay lake, and on the other side of the same conglomerate area half a mile north, at two or three places in the Gowganda region, and as pointed out by Dr. Miller, near Doherty station on the T. and N. O. railway.

### Relation of the Sudbury Animikie to the Huronian

The rocks enclosed in the nickel basin near Sudbury are isolated by the upturned rim of the sheet of nickel eruptive from the surrounding rocks and some uncertainty exists as to their age. In the first map of the region by Dr. Bell they were marked Cambrian, but in the text of his report it is stated that they "may be Upper Huronian or possibly Lower Cambrian."<sup>40</sup> In later writings they have generally been considered Animikie or, in accordance with the classification of the International Committee, Upper Huronian, which is the equivalent of the Animikie of Lake Superior. As this area is hundreds of miles from the nearest undoubted Animikie the correlation is naturally somewhat uncertain, since it is largely lithological. Dr. Collins has recently suggested the name Whitewater series for them because of this uncertainty. It has been shown on former pages that the Ramsay Lake conglomerate is the equivalent of the basal conglomerate in the typical Huronian region, and the suggestion has been made that the Trout Lake conglomerate, resting on the nickel eruptive and at the base of the series of sediments in the nickel basin, may be of the same age. The two conglomerates have some features in common. They are both coarse textured and contain many boulders of granite; and there are phases of the two which look somewhat alike. They are only seven and a half miles apart and if formed at the same time they should be closely alike, since the conditions would not have varied much in so short a distance; but a careful comparison shows that they differ from one another in important ways.

Before proceeding to compare them it is well to note that the Trout lake conglomerate, having rested for a great length of time upon a sheet of molten rock 6,000 feet thick, is in most places profoundly metamorphosed so that there is an actual transition between the conglomerate and the micropegmatite beneath. In many places also it has been squeezed into schist conglomerate and on the whole it looks far more ancient than it really is. Parts of it were even mapped by Dr. Bell as Laurentian gneiss. In order to get a correct idea of it the greatly altered sections along the Canadian Pacific railway should be left out of account and only the least modified parts should be used for comparison with other conglomerates. The least changed outcrops are on certain high and rough hills north of Cameron creek near Sultana mine, at the southwest end of the nickel basin, where the eruptive sheet is relatively thin and has had less effect than elsewhere. Here one finds a dark gray fine grained matrix enclosing pebbles and boulders of granite, quartzite and greenstone. The granite boulders are often three feet in diameter, and one was found with diameters of 3½ feet by 5 feet so that the rock suggests tillite. In various places the Trout Lake conglomerate contains pebbles of chert as well as those mentioned.

The Ramsay Lake conglomerate (basal Huronian) has a matrix of greywacké, much more silicious than that of the Trout Lake conglomerate, and thus far no chert



pebbles or boulders have been found in it, so that the two have marked points of difference.

The Whitewater series includes also thousands of feet of tuff and of black carbonaceous slate, with a gray sandstone on top, the whole amounting to more than 9,000 feet. If we compare this with the typical Huronian 70 miles to the west we find only one variety of rock common to both, the basal conglomerate. The typical Huronian includes no tuff, black slate nor gray sandstone, and the Whitewater series lacks white quartzite, except in trifling amounts, red arkose, jasper conglomerate and limestone. The upper conglomerate of the Huronian has no equivalent in the Whitewater series. It will be seen then that the two series differ in every respect except that each has a basal boulder conglomerate.

If we compare the Whitewater series with the typical Animikie on Thunder bay, 400 miles west, we find that both have a basal conglomerate, a thick sheet of black slate containing anthraxolite, and a gray sandstone, sometimes called quartzite, however, on Thunder bay.

The tuff of the Whitewater series is lacking in the west; and the iron-bearing lower portion of the western Animikie, chert or jasper and siderite, is almost lacking in the east. It is evident that the resemblance between the Whitewater series and the typical Animikie is much more striking than that between the Whitewater series and the Huronian, though the former is far away and the latter close by. Unless more convincing evidence can be brought forward than any known at present the sedimentary series resting on the nickel eruptive should be considered Animikie.

As the series has been described in reports on the Sudbury region it will not be necessary to give details as to the subdivisions here.

### The Keweenawan

Although rocks considered Keweenawan occur in or near the Sudbury and Huronian areas they are not so largely developed as to give them much importance in the scheme of classification, and they will be referred to here merely to complete the subdivisions of the pre-Cambrian. Near Sudbury the only rock classed as Keweenawan is the nickel eruptive itself; and the proof of its exact age is not very certain. Its metamorphism of the Trout Lake conglomerate which rests upon it proves that it is later than the Whitewater series, probably of Animikie age, but how much later is doubtful. It might be Cambrian or Ordovician so far as positive evidence goes, but the Keweenawan was a period of great eruptive and also irruptive activity and we are not aware even of dikes of eruptive rocks in Ontario which can be dated positively as Paleozoic. It is natural therefore to place the huge laccolithic sill of the nickel eruptive,  $1\frac{1}{4}$  miles thick and covering more than 400 square miles, in the great volcanic period of the late pre-Cambrian.

Sedimentary rocks of Keweenawan age occur with eruptives at Point Mamainse, a little north of the west end of the typical Huronian. They are the usual coarse sandstones and conglomerates and will not be described further.

### Summary

From the account of the pre-Cambrian north of Lake Huron just completed it will be seen that in a region 175 or 200 miles long from east to west and 50 broad from north to south, including the typical Huronian and the Sudbury district, there are rocks, both sedimentary and eruptive, of every recognized series of the pre-Cambrian of Canada, with the exception of the Couchiching, which Lawson places below the Keewatin some hundreds of miles to the west. There is no other known region where all the pre-Cambrian elements come so close together and no other so favorably placed to solve the difficulties of classification. It has the great advantage also that the first reasonably accurate map of the northern pre-Cambrian was made in the typical Huronian region and that authentic Huronian and Laurentian rocks as named by the founder of

our geology occur there in characteristic outcrops. The region gives a fixed starting point from which to expand our knowledge of the most ancient formations. The following divisions can be distinguished, beginning with the oldest. The Keewatin (iron ranges, schists and basic eruptives); the Grenville (schists, quartzite and a little crystalline limestone); Granite eruptive through the older rocks; the Sudbury series (arkose, greywacké, quartzite, conglomerate and some basic eruptives); Laurentian granite and gneiss eruptive through all the older rocks; Huronian (conglomerate, quartzite, arkose, and limestone); Animikie (Whitewater series, conglomerate, tuff, carbonaceous slate and sandstone); Keweenawan (lavas, conglomerate and sandstone near Mamainse, probably the nickel eruptive, at Sudbury); Sault Ste. Marie sandstone and shale, probably Cambrian; Ordovician shales and Silurian limestone and shale on islands to the south.

Unfortunately the relations of these different formations are often difficult to work out, since fossils are found only in the Ordovician and Silurian, and the column of the more ancient rocks is nowhere continuous. In most of the earlier work the Grenville, the older granite, and the Laurentian have been confounded; and the Sudbury series and the Animikie have been confused with the Huronian. It has been the purpose of this paper to disentangle these two groups and to present an orderly sequence of rocks as to age. From the historical point of view the following was the succession of events:

**KEEWATIN**—Volcanic eruptions, mostly of basic lavas, and the deposit in the sea of sediments rich in silica and iron. The floor on which the deposits were laid down is unknown.

**GRENVILLE**—Deposit of muddy and sandy sediments on a sea bottom which is no longer known to exist. The relations to the Keewatin are uncertain.

A time of great granite eruptions tilting and metamorphosing the older rocks, followed by a prolonged dry land period of erosion.

**SUDBURIAN**—Coarse sediments due to the weathering under cool climate or possibly desert conditions of a land surface consisting largely of granite, producing boulders, gravel, feldspathic and pure quartz sand as well as mud. The deposits have characters suggesting that they may have been formed largely on land, on a floor not yet discovered; but volcanic eruptions showing pillow structure toward the close seem to have been submarine.

The Laurentian batholiths of granite and gneiss lifted the Sudburian and other rocks into mountain ranges which were later destroyed by weathering and erosion under continental conditions, producing a peneplain.

**HURONIAN**—Begins with boulder conglomerate or tillite resting on the pre-Huronian peneplain, formed under glacial conditions; followed by the shallow water of lakes or the sea, in which deltas, sometimes of pure quartz sand, but often containing much undecomposed feldspar, were spread out thickly, probably all under a cool climate. Some limestone formed.

**ANIMIKIE**—Boulder conglomerate followed by explosive volcanic activity when glass fragments fell into water and were buried later under thousands of feet of mud charged with organic matter. The series ends with the laying down of coarse muddy sand.

**KEWEENAWAN**—Great volcanic eruptions and formation of laccolithic sheets with subordinate coarse sediments. Probably warm climate and desert conditions, since the sediments are mostly red.

# THE CHEMICAL COMPOSITION OF NATURAL GAS FOUND IN ONTARIO

By G. R. Mickle, Mine Assessor

## Object of Investigation into Composition of Natural Gas

It seemed desirable to undertake an investigation of this kind both from the importance of natural gas as one of the mineral products of Ontario, ranking as it does about sixth in value, and also from consideration of the fact that no systematic examination has been made of this most interesting product in the past. All natural gas has been considered to be the same provided it would burn. Yet even minute changes in the composition may be of great importance as can be seen by the alteration of even a fraction of one per cent. of certain constituents. This was forcibly brought to the attention of many consumers during the last few months when a change was made in the source of supply sent into certain towns, the gas from Kent being substituted for that obtained from Haldimand, Welland and Norfolk. A reference to the analyses given will show that the disturbance was caused by about one-half of one per cent. of hydrogen sulphide. As far as the heating power was concerned, which is the only thing which gives the gas any value, this meant only an inappreciable change. Even if hydrogen sulphide had no calorific power, the substitution of such a small amount would be negligible, but it has a substantial fuel value, so the effectual change in the gas for heating purposes was insignificant; yet, the actual practical effect both to the producer and consumer was very considerable.

If less than one per cent. can make a difference in the composition of the gas it seemed desirable that the other ninety-nine per cent. should be investigated and a definite knowledge of its composition acquired. A study of the composition and the variations in this composition in different fields and different parts of the same field might not unreasonably be expected to be an aid in the exploration for gas.

## General Considerations in Sampling Natural Gas

In order to determine whether and to what extent there are variations in the gas in different parts of the same field, it is obvious that the only method which can lead to this result is to take a number of samples from the wells direct and not from pipe lines supplied from a number of different wells. An analysis of a mixture from different sources can never determine variations in the sources themselves. Illustrations of this statement will be seen when the analyses are considered. Of course if the object of an analysis is to determine what kind of fuel is being supplied to any particular place, the sample is properly taken from the pipe line. No doubt many of the analyses quoted are made with this object, but they should not be confused with those intended to show variations in composition in different parts of the same field.

The only rational way to ascertain the composition of a gas in any field is to sample a number of wells distributed in some systematic way over the area in question before any considerable amount of gas is drawn from the field. It is plain that once gas is piped from any area the original disposition of the gas is altered, as it begins to flow towards the wells supplying gas to the mains to replace that which is drawn off. It can be readily seen that this will complicate matters and put it beyond our power to ascertain the absolute truth, but by taking samples in the way outlined above before the field has been drawn upon and then again from the same wells when the pressure has dropped say 20 per cent., and again after a further substantial drop in pressure, some close approximation of the true composition must be arrived at. As far as the gas in some of the fields in Ontario is concerned, it is too late to make a systematic investigation of it, although it will be seen in discussing the results of the



analyses that probably there has been no great change in the composition of the gas, but in others, notably the Kent field, the degree to which the gas is exhausted is so small that the results are almost of as much value as if they had been obtained in the first days of operation, and, if continued as indicated above, in the end a true idea will be had of the composition and variations of the gas in different parts of this most interesting and valuable area. For fields which will be discovered in the future there is no reason why our knowledge should not be complete.

### Method of Sampling

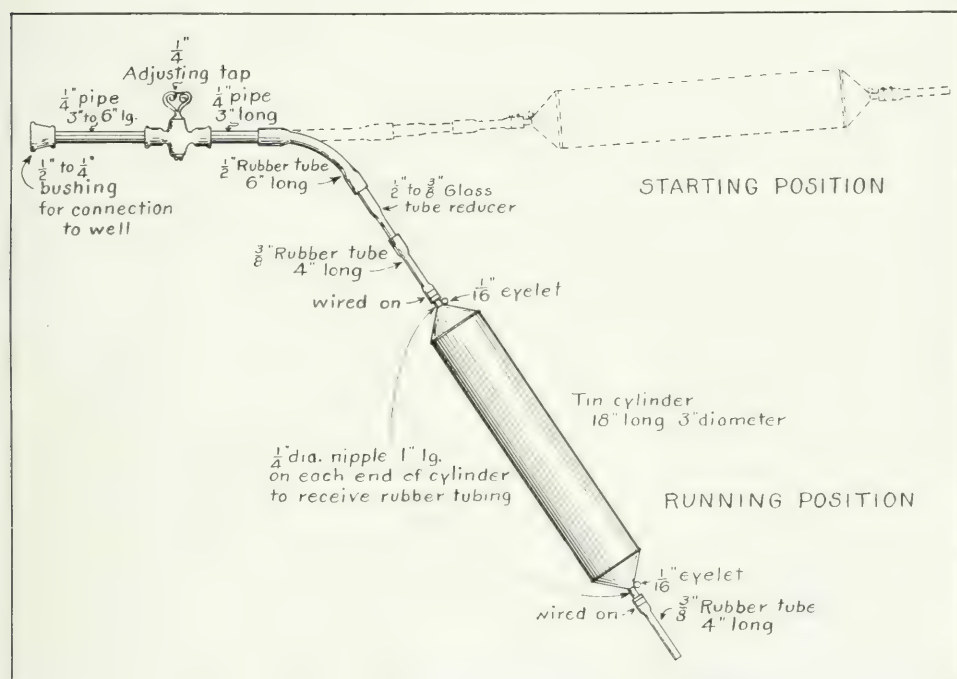
Having decided that the gas should be sampled at the wells the way in which this can best be done will be considered. The gas-holders must be convenient to handle and capable of containing an ample supply of gas for analysis. The writer first used those made of glass supplied by dealers in chemical apparatus and illustrated in their catalogues. These are simply glass tubes of various sizes, two inches more or less in diameter and four inches more or less in length terminating at each end in a small tube fitted with a ground glass stop cock. These did not appear to be convenient, the chief objection being their small capacity; they hold 250 to over 500 c.c. If it should be necessary to re-sample any well owing to the quantity taken at first proving insufficient, it would in some cases take several days to secure another sample. It seemed desirable, therefore, in order to provide against all accidents in the laboratory, to take a sample of gas containing not less than two litres. Glass vessels of any kind capable of holding this amount would be inconvenient to take to and from the wells, and accordingly it was decided to use metal holders, and tin cylinders as shown in accompanying sketch were made. These contain a little more than two litres. Before using, each cylinder was tested for leaks by plugging one end, connecting the other with a bicycle pump, holding under water and forcing air into it. Any leak is instantly indicated by bubbles. These tin cylinders were used in preference to steel ones, provided with taps at each end, on account of their lightness and consequent convenience in handling. Any cylinder provided with taps capable of holding gas perfectly must necessarily be fairly heavy in construction, whereas, these tin cylinders, which in the end proved very satisfactory and convenient both for the collection of the samples and afterwards in the laboratory could be made into a package of six or eight tubes and carried as conveniently as a small hand valise. The only point in which a tap is superior to the method used in closing the ends is that the tap is more conveniently closed. This cylinder is only to be closed once in the field, hence, there does not seem to be any reason for introducing taps with all the attendant anxiety about possible leaks at the tap.

A few preliminary samples were taken in the ordinary glass holders both by displacing water and displacing air. When water was used the gas was allowed to blow through about two minutes after the water was gone. If air displacement was used five minutes were given. These samples showed at the most 0.1 per cent. oxygen. Before the tin cylinders were tried, in order to have some measure of the time it would take to fill one of the tubes with gas at the rate it was allowed to blow through, provided the cylinders were empty, the cylinder was first filled with water and then gas or air blown in—the water was gone in less than one minute. Now the employment of the air displacement method is based on the assumption that there is some kind of uniform diffusion of air and gas in the holder used. If the gas is blown in at such a rate as to fill the cylinder in one minute, then provided the diffusion of the air and gas is perfect, at the end of one minute the mixture in the cylinder would be 50 per cent. air and 50 per cent. gas; at the end of two minutes it should be 25 per cent. air and so on. At the end of 10 minutes there should only be 0.1 per cent. air in the cylinder. In order to remove this and allow for irregularities, 15 minutes were decided on as a sufficient time, and the gas allowed to flow at a rate stronger than one could blow with the mouth.



### Troubles with Air in Samples

A batch of 11 samples was taken in the way explained above. They were almost a complete failure. Only one contained no oxygen at all; another had 0.2 per cent., equivalent to 1 per cent. air; two more had a little less than 2 per cent. oxygen or less than 10 per cent. air and the rest contained over 10 and up to 30 per cent. air. The high oxygen samples were discarded as absolutely useless. The cylinders were tested again for leaks and found to be perfectly tight. Moreover, they were under slight pressure due mainly to the fact that the temperature outside on the days these first samples were taken was about 20°F. and of course the gas expanded on being brought into a laboratory at say 65°. Any leak would, therefore, have been outwards not inwards. The time was then increased to 25 minutes, and as the best results seemed



Gas sampling Cylinder

to be obtained at the lower pressure wells where not such a strong stream was allowed to pass through, a gentler flow was used. Of the three samples taken this way one contained 1.4 per cent. oxygen or 7 per cent. air and was discarded; another had .1 per cent. and one a trace only. After this the water displacement method was used with entirely satisfactory results. Out of nearly 40 samples taken with water the worst showed only .1 per cent. oxygen, and in this case the rubber tubing shown in the sketch blew off towards the end of the operation and of course there was a chance for air to enter.

### Mode of Sampling with Water

The operation with water was carried out as follows:—The tubes are most conveniently filled with water in town at a tap by slipping the  $\frac{1}{2}$  inch rubber tubing over the tap, holding the tube upwards and turning the water on partly till it flows out of the top of the cylinder. The two pieces of rubber tubing at the ends are then turned over and tied with string.

### Details of Sampling at the Well

The method of sampling at the well can be seen by reference to the sketch. Most of the wells sampled had a  $\frac{1}{2}$ -inch connection for a pressure gauge into which the  $\frac{1}{2}$ -inch bushing was screwed. Then the valve on the well was opened till the maximum flow used in the operation was reached. This was about as strong as one could blow with the mouth. Then the adjusting tap was nearly closed so that only an extremely small flow of gas came through. The cylinder is then held slightly inclined upward as shown in sketch, and connection made with the glass reducer into the rubber tubing wired to the inlet end. The water of course immediately begins to flow, and, as it is reduced in quantity, the outlet end is gradually lowered, keeping thus always a water seal on the outlet. Towards the last the tube is nearly vertical. The water takes a little more than a minute to flow out. Then the adjusting tap is gradually turned on full and the gas allowed to flow through for five minutes. After this pinch the rubber tubing at the outlet end and almost immediately afterwards close the adjusting tap and pinch the rubber tubing at the inlet end. Detach this from the glass reducer and turn over both ends carefully and lash securely with string, taking care not to turn the rubber tubing over sharp on the end of the tin nipple, whereby it might be cut. At wells where the  $\frac{1}{2}$ -inch connection was vertical an elbow was used, as it is most convenient to have the gas flowing out horizontally into the  $\frac{1}{4}$ -inch pipe. The writer believes that the water method is much the easiest and most satisfactory. With holders of any reasonable capacity the air displacement method must lead either to an unnecessary loss of time or occasionally spoilt samples. The method of sampling is given in detail as it is evident on seeing many of the analyses of gas published that the irregularity of diffusion of air and gas is not generally fully realized. A number of results showing oxygen are given for illustration. There is not the slightest reason for believing that there is a trace of oxygen in any of the Ontario gases. Further grounds for thinking that it never exists in natural gas will be given later on.

### Difficulties in Sampling when Hydrogen Sulphide is Present in Gas

Some trouble was experienced in sampling the Kent gas with tin cylinders owing to the presence of hydrogen sulphide in the gas. It was anticipated that there would be some reaction between the metal cylinder and the gas, and the original plan was to take check samples for hydrogen sulphide only in glass holders from two of the wells. These could be small, say 250 c.c. It was thought that, as the cylinders were made of the same material and were of the same size, it would be shown that a certain definite amount of the sulphide would be eliminated and that this could be applied as a constant correction on all the other samples. It was found, however, that all the hydrogen sulphide was eliminated in the case of samples containing as No. 2, 0.3 per cent. It was therefore necessary to sample all the wells for hydrogen sulphide using glass holders. The sampler's trouble was caused by the fact that the hydrogen sulphide was too easily eliminated. Just at the very time this happened the producers and consumers of the Kent gas were having difficulties of exactly the opposite kind. This seemed an unnecessary aggravation to the sampler.

The presence of hydrogen sulphide in any gas is usually known beforehand. It is very easily identified by means of lead acetate. A *freshly made* solution of this salt was used in testing the Kent and all the gases except where this compound was known to be absent. If filter paper be moistened by the solution and exposed to the gas, a dark coloration is almost instantly produced by hydrogen sulphide. By noticing the difference in the rapidity and intensity of the coloration by gas from two wells the hydrogen sulphide of which has been determined quantitatively it was found that the percentage could be estimated approximately by the eye. With more practice and using a more dilute solution no doubt a fairly accurate determination of the hydrogen sulphide could be made.

For wells showing hydrogen sulphide by the lead acetate test, a small glass holder containing say 250 c.c. could be filled for the determination of this compound only, in addition to taking a sample in the tin cylinder for the other constituents. This would be easier than handling anything of glass capable of holding two litres.

### History of Wells Sampled

#### General Statement

For convenience in referring to the accompanying map, all the wells which were sampled are numbered according to Counties, the boundaries of which are shown by heavy broken lines. The information regarding the wells which might have an influence on the composition was obtained from the owners of the wells. In some cases records had not been kept or wells had been sold and the history was not complete. Date of sampling and by whom taken is given for purpose of future reference. A brief statement is also made regarding each field. Commencing at the west end the various areas sampled are briefly described.

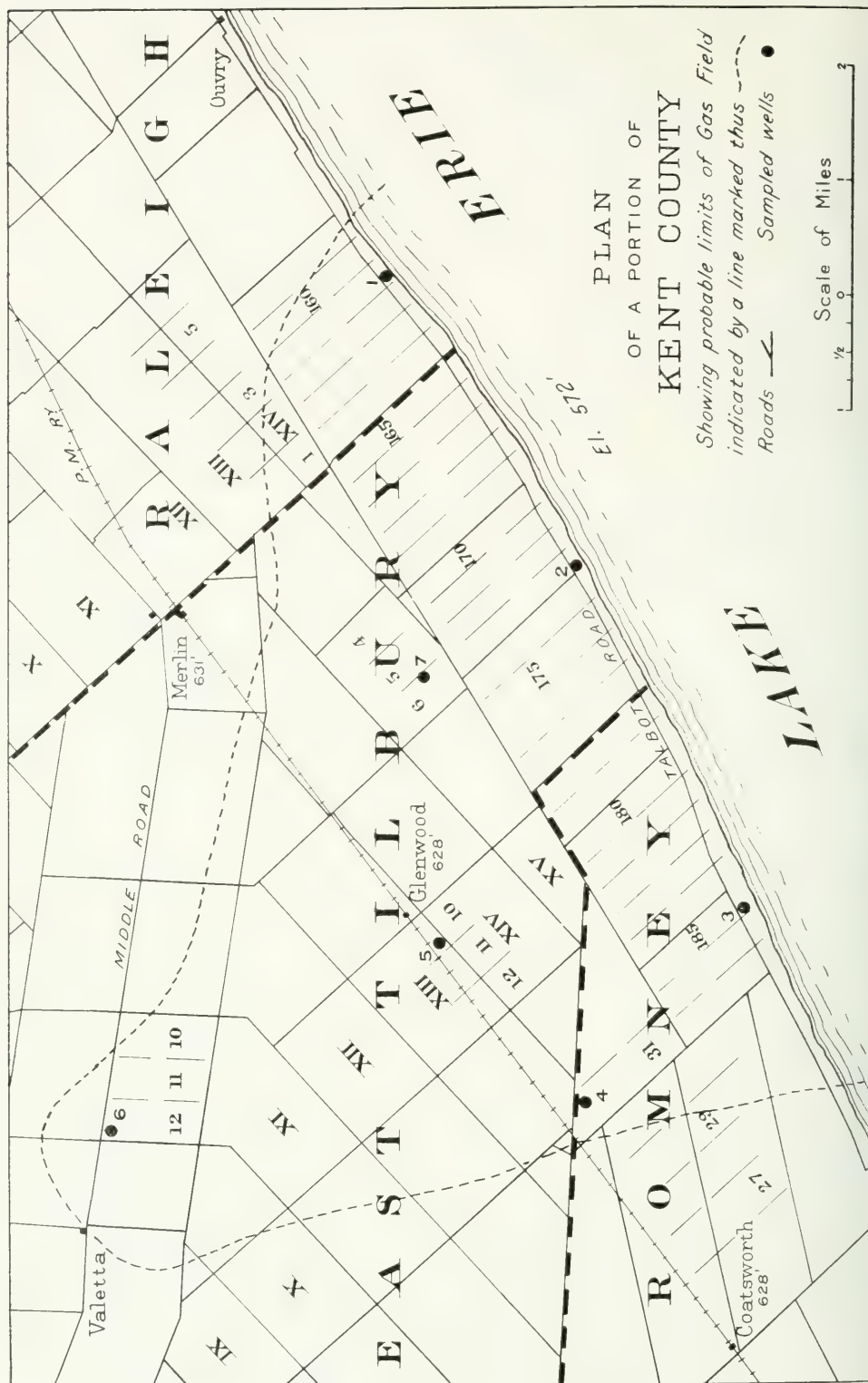
#### Essex Gas Field

This field was abandoned by the gas operators about two years ago. A few wells are still supplying gas to farm houses. The field was a small one, probably not over three square miles in area. A description with log of the first well drilled here is given in a paper by Eugene Coste entitled "Natural Gas in Ontario" (Jour. Can. Min. Inst. Vol. III). The following notes are taken from this paper. The well was drilled in January, 1889, on the extreme north end of the same lot as the one sampled. Gas was found at a depth of 1020-1031 feet in dolomite of the Guelph formation. The well measured over 10 million cubic ft. "open flow" and registered 460 lbs. pressure.

The particular well sampled was on the Fox farm, lot 7, Con. 1, Tp. of Gosfield South about 300 feet from Lake Erie. The original pressure of this well is said to have been about 500 lbs. and depth 1020 ft. The pressure is now about 50 lbs. This well is called Essex No. 1, in list of analyses and on the map. Sampled May 1st, 1914, by the writer.

#### Kent Gas Field

This small but valuable area first appeared as a gas producer in 1907. The production from this field up to the end of 1913 amounted to about 31,000 million cubic ft. The land area is about 31 square miles. It is often called the Tilbury field from one of the townships in which the gas is found, but a glance at the plan will show that the field takes in portions of the townships of Romney and Raleigh. All parts are not of equal value, the portion in Romney being particularly productive, and in general, the wells with the largest capacity are found in the southern part of the field adjoining Lake Erie. Undoubtedly the gas-bearing rock extends under the lake some distance. The gas is found in dolomite of the Onondaga formation. (Jour. Can. Min. Inst., Vol. X, p. 82.). The wells sampled were selected according to their location in such a way as to have a systematic distribution over the gas producing area. Owing to the difficulties explained under the description of the method of taking samples and to troubles caused by the presence of hydrogen sulphide, it will be noticed that the check samples taken for hydrogen sulphide in glass holders, and the general sample used in determining the other constituents were sometimes obtained on different dates. In all cases the capacity is the number of cubic feet in 24 hours as measured by the Pietot tube after the well was finished. All the samples in Kent were taken by the writer with the exceptions noted later on. This field is shown on plan to larger scale.





## Wells Sampled

KENT. No. 1—Well on the L. S. Baker farm, lot 161, Raleigh Tp. This well is 1424 ft. deep. Gas was found at intervals from 1310 ft.-1420 ft. Capacity 450,000. Original pressure 566 lbs. Pressure now 565. Drilled Jan., 1912. Check sample for  $H_2S$  taken in glass holder, March 3rd, 1914. General sample taken 11th April. Tested with lead acetate 23rd March and 11th April; on latter date gave faintly perceptible coloration in about 5 seconds, whereas No. 2, with 0.3 per cent.  $H_2S$  gave a strong color practically instantly.

KENT No. 2—Well on J. W. Askew farm, lot 173, Tilbury East Tp. Depth 1372 ft.; capacity 2,000,000 feet; drilled March, 1914; pressure 522 lbs. Sample for  $H_2S$  and general sample taken March 23rd.

KENT No. 3—Well on H. Baldwin farm, lot 185, Romney Tp. Depth 1387 ft.; gas found from 1140 ft.-1380 ft.; capacity 3,500,000; drilled July, 1911; original pressure 585 lbs.; pressure now when closed 5 minutes, 436 lbs. Sampled for  $H_2S$  April 11th; general sample, taken May 30th by Mr. L. Near, Field Supt. of Union Natural Gas Co.

KENT No. 4—Well on D. W. Lee farm, lot 31, Romney Tp. Depth 1380 ft.; gas found 1260 ft.-1375 ft.; capacity 1,800,000; drilled Dec., 1913; original pressure 483 lbs.; present pressure when closed 5 minutes, 400 lbs. Sampled 23rd March;  $H_2S$  sample taken 11th April.

KENT No. 5—Well on Jas. Halliday farm, lot 10, Con. 13, Tilbury East Tp. Gas found 1260 ft.-1383 ft.; capacity 221,000; drilled early in 1913; original pressure 510 lbs.; now, 450 lbs. Sampled 23rd March for  $H_2S$  and general sample.

KENT No. 6—Well on R. & E. Graham farm, lot 12, Middle Rd. South. Depth 1365 ft.; gas 1303 ft.-1325 ft.; capacity 500,000 ft.; drilled April, 1907, for oil and bought from the oil operators. Original pressure not known; when purchased several years ago was 415 lbs.; now 418 (due no doubt to shutting off waste of gas in vicinity). Sampled 19th March (general) and 3rd March for  $H_2S$ .

KENT No. 7—Well on the Dawson farm, lot 6, Con. 15, Tilbury East. Capacity 2,000,000; drilled in 1909; original pressure 595; present 519; general sample taken 23rd March, for  $H_2S$  on 11th April.

## Samples of the Surface Gas from the Drift taken in Kent

Two samples of this kind were taken in Kent. The results are discussed elsewhere under "surface" or drift gas. The exact location of these samples is shown on map.

Sample called "Howard Tp. Surface" was from a well drilled for water on lot 7, Con. 12, Howard Tp., on F. Fenningsdorf's farm. The information following is obtained from him. Well is 186 ft. deep and is in hard pan. No water at all was found in well. Rock said to be at 240 ft. depth in neighborhood. The well has been supplying gas for 21 years for all purposes in Mr. Fenningsdorf's house. Two other farm houses in the vicinity have been using gas from other wells for the same length of time and one other for two years. What this means in quantity will be discussed as indicated above. At the time the well was drilled the pressure was measured as 56 lbs., but has not been tested since. The owner states he cannot notice any drop in pressure. Sampled March 2nd by writer.

Sample marked "Raleigh Tp. Surface" was from water well 156 ft. deep on lot 1, Con. 12, Raleigh Tp. The owner of the well used the gas for a time in his house before the pipe lines of the regular producers were convenient. Have no estimate of the quantity produced by this well. Sampled 3rd April by Mr. L. Near, Field Superintendent of the Union Natural Gas Co.

### Gas in Lambton County

This is a new field found by deep drilling in Oil Springs. Further details regarding this discovery will be found under "Natural Gas Industry in 1913." Two wells were sampled here, viz.:

LAMBTON No. 1—Fairbanks well, lot 18, Con. 2, Enniskillen Tp. Depth 1912 ft; gas found first at 1898 ft. Capacity said to be 15,000,000 ft. (Tube used only capable of measuring 11,000,000 feet); pressure 830 lbs. This well was drilled in only a few days before it was sampled by the writer on 21st March. Lead acetate test showed no trace of  $H_2S$ .

LAMBTON No. 2—Well drilled by the Oil Springs Co. This well was sunk in the summer of 1913. It is only about 700 feet distant from Lambton No. 1 (easterly in direction) consequently it could not be shown on the scale used on the map. Pressure probably same as No. 1, not measured. Sampled by the writer on 21st March. Lead acetate showed no trace of hydrogen sulphide.

LAMBTON No. 3—Well on east  $\frac{1}{2}$  of lot 26, Con. 4, Euphemia Tp. This well was still being drilled when sampled. Owners stated it was about 1700 feet deep and the gas was coming from about 1600. Capacity not known. Well not entirely closed when sample was taken by the writer from pipe leading from top of casing. Lead acetate showed no trace of  $H_2S$ .

### Gas in Elgin County

This small gas producing area in Bayham Tp. was found in 1910. Only one sample taken here.

Elgin No. 1, from R. Balcom well No. 1, Vienna village. Depth 1330 ft.; original pressure 710 lbs.; present pressure 350 lbs.; drilled in Sept., 1910; gas in the Clinton. Sampled by Mr. Donald Sharpe, gas inspector for that district, April, 1914.

### The Welland-Haldimand-Norfolk-Brant Gas Field

It is difficult to separate the areas in these counties. The first well was drilled in August, 1889, in Bertie Tp., Welland Co., about two miles north of Welland No. 2 shown on plan. This well measured 1,700,000 cubic ft. and was 836 ft. deep, gas being in White Medina sandstone. The pressure was 525 lbs. This information is taken from paper above quoted by Mr. Coste, which contains logs of a number of wells in Welland Co. Since that time the drilling has extended westward through Haldimand and Norfolk Counties and up into Brant and Wentworth. In general the gas-bearing rock does not extend back far from Lake Erie. Most of the gas is obtained from Clinton and the Red and White Medina. There are wells in all the townships fronting on the lake, beginning with Bertie in the East, through Welland, Haldimand and Norfolk. Probably the most productive townships have been Bertie, Humberstone and Rainham. It cannot be regarded as a continuous field. It will be noted that a number of the wells sampled are nearly exhausted, so that the possible influence of this on the composition can be studied.

#### Details of Wells Sampled in Welland-Haldimand-Norfolk-Brant-Wentworth Gas Producing Area

A brief statement is given of the history of the wells sampled in each of the counties. In many cases, owing to change of ownership or neglect of keeping records, the history is incomplete. All the samples in this territory were taken by Mr. Donald Sharpe, except where otherwise stated.

NORFOLK No. 1—J. R. Buck well, west part of Village of Port Rowan; depth 1420 ft.; pressure 450 lbs. originally; present, 400 lbs. Gas in Red Medina. Sampled 15th April.







NORFOLK No. 2—E. Foster well at Port Royal. Depth 1410 ft.; pressure now 400 lbs. Gas in Red Medina; sampled 15th April.

NORFOLK No. 3—Well in Port Dover. Drilled Jan., 1912; depth 1043 ft. Mostly White Medina. Sampled 15th April.

HALDIMAND No. 1—Well on lot 25, Con. 3, Dunn Tp., in Port Maitland. Depth 880 ft.; original pressure 350 lbs.; capacity 1,000,000; pressure now 275 lbs. Gas in White Medina. Sampled 12th March by Donald Sharpe and the writer.

HALDIMAND No. 2—Well on H. P. Docker farm, lot 18, Con. 4, Dunn, south of Dover Road. Depth 930 ft; original pressure 465 lbs.; now 300 lbs.; capacity 470,000; drilled Nov., 1912. Gas in Red Medina. Sampled 8th April.

HALDIMAND No. 3—Well in Caledonia village. Depth 400 ft.; original pressure 245 lbs.; now 10 lbs. Gas in Clinton. Drilled in 1894. Sampled 3rd April.

HALDIMAND No. 4—The Wm. Carpenter well about one mile from No. 3. Gas at 390 ft.; pressure 245 lbs. originally; now, 140; drilled 1908. Sampled April 3rd.

HALDIMAND No. 5.—Joseph King's well, well north of the Grand River, North Cayuga Tp. Depth 725 ft; pressure now 225 lbs. Gas in White Medina. Sampled 17th April.

HALDIMAND No. 6—Well on Wm. Pridmore farm, lot 22, Con. 5, South Cayuga Tp. Pressure now 250 lbs.; depth 785 ft. Gas in Red Medina. Sampled 18th April.

HALDIMAND No. 7—Well on Jas. Topp farm, South Cayuga Tp. Pressure now 285 lbs.; depth 700 ft. Gas in Red Medina. Sampled 18th April.

HALDIMAND No. 8—Well on R. Windecker farm, lot 8, River Rd., North Cayuga Tp. Depth 735 ft. Gas in White Medina. Pressure now 250 lbs. Sampled 17th April.

HALDIMAND No. 9—Well on Joseph Steele farm, lot 18, Con. 1, Walpole Tp. Depth 960 ft.; original pressure 450 lbs.; now 87 lbs. Gas in Red Medina. Sampled 21st April.

HALDIMAND No. 10—Well in Lake Erie on water lot No. 1, Crown lease, opposite Rainham Tp. Drilled 1909; original pressure 500 lbs.; now 100 lbs. Gas in Clinton and Red Medina. Sampled 20th April.

HALDIMAND No. 11—Well in Lake Erie water lot No. 5, Crown lease, opposite Rainham Tp. Original pressure 500 lbs.; now about 100. Clinton gas. Sampled 20th April.

HALDIMAND No. 12—Well on S. McLeod farm, lot 13, Con. 4, Seneca Tp. Gas in Clinton at 397 ft. and White Medina at 497 ft. Drilled July, 1913. Sampled May 1st.

WENTWORTH No. 1—Well on David Hall farm, lot 23, Con. 9, Binbrook Tp. Depth 500 ft.; pressure 186 lbs.; drilled Dec., 1913, and shut in. Gas in Clinton and White Medina. Sampled May, 1914.

BRANT No. 1—Well in yard of Cockshutt Plow Works, Brantford. Depth 550 ft. in Medina—some gas from Clinton too. Original pressure 310 lbs.; now 20 lbs. Capacity 775,000 at first, but dropped quickly, now very small, less than 10,000. Drilled in 1903. Sampled 4th April by Donald Sharpe and the writer.

BRANT No. 2—Well on Wm. Macdonald farm, part lots 6, 7, 8, in 2nd Con., Onondaga Tp. Gas at 400 in Clinton and 515 in White Medina. Capacity 70,000, half from Clinton. Well not finished when sampled, (partly open) April 4th by Donald Sharpe and writer.

BRANT No. 3.—Well on Wm. Brette farm, part of lots 6, 7, 8, in 3rd Con, Onondaga Tp. Gas in Clinton at 400; nothing in Medina. Depth 590 ft. Sampled April 4th by Donald Sharpe and writer. No. 3 is about half a mile from No. 2.

WELLAND No. 1—Well on south end lot 13, Con. 2, Humberstone Tp. Depth 830 ft. Original pressure 500 lbs.; now about 50 lbs. Capacity originally 500,000. Gas in White Medina. Drilled 1891. Sampled 8th April.

WELLAND No. 2—Well on lot 34, Con. 1, Bertie Tp. Depth 888 ft. Capacity 1,000,000. Original pressure 400 lbs.; now 100 lbs. Drilled April, 1910. Gas in White Medina. Sampled 11th March by Donald Sharpe and writer.

WELLAND No. 3—Well on east side of lot 12, in the 14th Con., Bertie Tp. Depth 578 ft.; original pressure about 360 lbs.; capacity 430,000 originally. Pressure now 100. Drilled July, 1897. Gas in Clinton. Sampled May 1st.

WELLAND No. 4—Well on lot 15, in the 5th Con., Bertie. Depth 565 ft.; original pressure 350 lbs.; now 120 lbs.; capacity 250,000; drilled Nov., 1907. Sampled 23rd March.

WELLAND No. 5—Well on lot 2, Con. 4, Willoughby. Gas at 2940 ft. in the Trenton limestone. Well was continued to the Archaean at 3030 ft. Capacity 250,000 originally and pressure 1000 lbs. Present pressure 100. Drilled in July, 1893. This is the deepest gas well in Ontario, and the only one in Trenton. Sampled 23rd March. Another well was sunk through the Trenton to the Archaean at 3257 ft. This well was about two miles southwesterly from Welland No. 3, but no gas was found in the Trenton. These notes are taken from "Natural Gas in Ontario," quoted above.

WELLAND No. 6—Well on J. J. Dickenson's lot in Port Colborne. Pressure now 185 lbs. Drilled in 1907. Sampled 10th April. Gas in White Medina.

WELLAND No. 7—Well on G. Jenkinson's farm, lot 7, Con. 4, Crowland Tp. Depth 550 ft.; original pressure 100 lbs.; now 6 lbs. Gas in Clinton and White Medina. Sampled May 2nd.

YORK No. 1—This sample was secured by the writer from a well drilled at the Dominion Bank building, King and Yonge Streets, Toronto, in Dec., 1913. The well was not drilled for gas and was almost immediately filled up with cement, the sample taken was leaking through the cement. No measurement was made of the capacity or pressure and the writer was not able to obtain any reliable estimate of the quantity. It does not appear to have been very important. Depth of well 1066 ft. Gas in the Trenton. Sampled Dec., 1913. This was not analysed in the same way as the other gases, but by the ordinary explosion one. The results are, therefore, given separately. Unfortunately the well was closed in altogether when the writer tried to secure a sample for the more accurate analysis later on.

#### York, Scarboro Tp., Surface

From well drilled for water at the St. Augustine Seminary, lot 25, Con. B, Scarboro Tp. The writer saw this for the first time, 20th Dec., 1913. Gas had then been blowing for seven days. Flow was measured and waste immediately stopped. Subsequently gas piped to boilers and used for three weeks under boilers. Eighteen burners were in use, about inch diameter. Flow of gas checked by water. Probably 4-5 million cubic feet were produced altogether by this well. Elevation of surface where well was sunk 525 ft. above sea. Well stopped at 330 ft. in shale (Lorrain). Gas mostly found at 290 ft. This particular vicinity is famous among geologists who have studied the Pleistocene especially and has been fully described by Dr. A. P. Coleman.\* According to his description of a section in the vicinity the gas was in the Toronto formation which is composed of interglacial beds extending 151 ft. above Lake Ontario and 41 below. The lake level being 246 ft., the top of the well is 279 ft. above the lake, and therefore at 290 ft. the well is 11 ft. below the lake level. Details regarding well were kindly furnished by the Rev. Father Kidd, President of the Seminary. The well was sampled again on 29th Jan. and again on the 28th of March. The analyses by Prof. Ardagh made by the explosion method all showed olefines and carbon monoxide in quantities not varying much from those given in the case of York No. 1. No ethane was shown. The analysis that appears in the table is by the slow combustion method and was made on the last sample taken.

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\* Excursions in vicinity of Toronto, Guide Book No. 6, Ontario Bureau of Mines.

## THE ANALYSIS OF THE GASES

## Methods of Analysis

By Professors W. H. Ellis, J. W. Bain and E. G. R. Ardagh,  
University of Toronto

The most careful study of the methods of analysis for natural gases, which has yet been published, is contained in Bulletin 42, U. S. Bureau of Mines, under the title "The Sampling and Examination of Mine Gases and Natural Gas," by G. A. Burrell and F. M. Seibert. The results of this investigation have shown that the ordinary methods must be modified when applied to the examination of natural gas, and these conclusions have formed the basis of the present study.

*Carbon dioxide* was determined in the usual manner by absorption in potassium hydroxide solution.

*Oxygen.* Burrell and Seibert<sup>1</sup> have shown that alkaline pyrogallate is unsuitable for this determination and that phosphorus is also unreliable in the presence of large amounts of ethane and its higher homologues. In all the samples examined the ethane is comparatively low, and the higher members are present only in very small amounts so that no objection to the use of phosphorus could be raised on this ground. The usual form of phosphorus pipette was accordingly used, and nothing abnormal was observed during the investigation.

*Carbon monoxide and olefine hydrocarbons:* These have not been detected in the numerous samples analysed by Burrell and Seibert<sup>2</sup>, and accordingly our vases were first examined qualitatively with the aid of a dilute solution of palladium chloride.<sup>3</sup> About 100 c.c. of the gas was transferred to a glass holder and shaken with 5 c.c. of palladium chloride solution (0.5 g. PdCl<sub>2</sub> per 100 c.c.); after standing for at least one hour, a sooty scum could be observed if these gases were present. To test the delicacy of this reaction, 0.3 c.c. ethylene was introduced into the gas holder with the palladium chloride solution, the colour of the latter changed immediately and in 5 minutes a sooty scum appeared. With 0.1 c.c. of ethylene the action took place more slowly; 0.5 c.c. of illuminating gas gave a reaction practically immediately.

*Hydrogen:* Palladium black<sup>4</sup> heated to 100°C. was employed for the detection of this constituent, and its presence could not be determined with certainty in any of the samples.

*Paraffin hydrocarbons:* These were determined by the slow combustion method in a sample from which the carbon dioxide and oxygen had been removed and in which the absence of carbon monoxide, the olefine hydrocarbons and hydrogen had been proved by the methods just described. One hundred c.c. of oxygen were first passed into the pipette and about 25 c.c. of the sample was slowly admitted while the spiral of platinum wire was maintained at bright red heat. In order to assure the completeness of the combustion, the mixture was passed into and out of the pipette twenty-five times, and the total contraction was then noted. The carbon dioxide was absorbed as usual and the results were calculated on the assumption that methane and ethane only were present.

*Hydrogen sulphide* was determined by Tutwiler's method.<sup>5</sup> Harding and Johnson<sup>6</sup> show that this method invariably yields much too high results with coal gas, due no doubt to the presence of substances other than hydrogen sulphide which are acted upon by free iodine. In the case of natural gases, however, consisting practically entirely of paraffin hydrocarbons, such errors would not be encountered.

<sup>1</sup> Loc. cit., 87.

<sup>2</sup> Loc. cit., 76.

<sup>3</sup> Loc. cit., 80; Phillips, F. C., Amer. Chem. Journ., Vol. XVI, 1894, p. 267.

<sup>4</sup> Dennis, "Gas Analysis," Macmillan, 1913, p. 188.

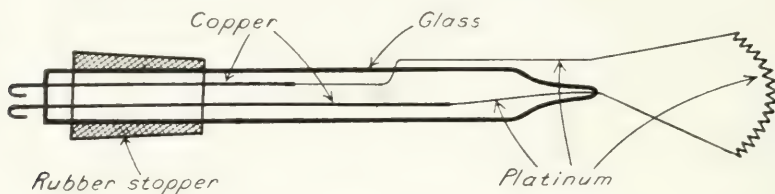
<sup>5</sup> Jour. Amer. Chem. Soc., Vol. XXIII (1901), pp. 172-7.

<sup>6</sup> Harding and Johnson, 8th Internat. Cong. App. Chem., 1912, Vol. XXV, p. 673.



### Apparatus Employed

The burettes and pipettes were of the Hempel form. The burettes were of 100 c.c. capacity divided to  $\frac{1}{2}$  c.c. and water jacketed. For the determination of carbon dioxide and oxygen, water was used as the confining liquid, while mercury served for the combustions. The analyses were carried out in a room where the temperature was kept as close as possible to 20°C.



Apparatus for Gas Analysis

Several forms of the slow combustion pipette were tried which did not differ materially from the form recommended<sup>1</sup> by Dennis.<sup>1</sup> It was found distinctly advantageous to introduce the two leads in the manner shown in the sketch. When the two leads were introduced separately through a double bored rubber stopper, it was difficult to make a gas-tight joint, and the effort to force the stopper home tightly resulted frequently in an objectionable distortion of the spiral. The latter was made of No. 32 platinum wire about 20 turns of about 1 mm. diameter.

### Detailed Method of Analysis

The constituents for which tests were made and which were determined when present in the samples of natural gas examined are (1) Hydrogen sulphide, (2) Unsaturated hydrocarbons, (3) Carbon monoxide, (4) Hydrogen, (5) Carbon dioxide, (6) Oxygen, (7) Methane, (8) Ethane, (9) Propane.

For hydrogen sulphide a qualitative test was made with lead acetate paper at each gas well. When lead-paper was not blackened at the well, the quantitative estimation with iodine was, of course, omitted.

The following description sets forth in detail the procedure for gases on which all determinations were carried out:

Hydrogen sulphide was the first constituent determined; the sample collected in the glass holder being employed for this purpose. One hundred cubic centimetres of gas were drawn into Tutwiler's apparatus,<sup>2</sup> mercury being used as confining liquid, about 5 c.c. of freshly-prepared starch solution were then sucked in, and standard iodine solution<sup>3</sup> (One litre contained 1.134 grams iodine. 1 c.c.=0.1 c.c. of hydrogen sulphide at 0° C. and 760 mm.) added a little at a time, shaking vigorously between each addition, until a standard blue colour resulted. Some time before the end-point was reached, a purplish-pink colour developed, reminding one strongly of the titration of hydrogen sulphide obtained from pig iron by the evolution method. It is a rather interesting fact that after all the hydrogen sulphide had been oxydized by the iodine, some of these gases still possessed a sickening stench far more disagreeable than hydrogen sulphide and not at all like it. This odour may possibly be due to traces of mercaptans.

The gas-sample in which the hydrogen sulphide had been estimated, was then examined qualitatively for unsaturated hydrocarbons and carbon monoxide by shaking it with palladious chloride ( $\text{PdCl}_2$ ) solution. The test was made by sucking about 5 c.c. of 0.5% palladious chloride solution into a small glass sampling tube of about 150 c.c.

<sup>1</sup> Dennis, loc. cit., p. 148.

<sup>2</sup> Jour. Amer. Chem. Soc., Vol. XXIII (1901), pp. 173-7.

<sup>3</sup> Hempel, "Gas Analysis," 1902 edition, pp. 237, 303.



capacity, evacuating the same by means of a water pump, introducing the sample of gas to be tested, shaking vigorously for perhaps a minute, and allowing to stand for some time. In not a single instance did any reducing action on the palladious chloride take place, even in cases where the gas samples were left for a whole day in contact with the reagent.

To determine the hydrogen, a sample of the gas, freed from hydrogen sulphide and saturated with water vapour, was mixed with oxygen and passed through a tube containing palladium-black heated in a boiling water-bath.<sup>1</sup> In every case the result was negative, or so nearly so as to be within the limits of error for the method.

To determine the carbon dioxide, 100 c.c. of the gas from which the hydrogen sulphide had been removed by shaking with a solution of lead acetate in distilled water slightly acid with acetic acid, were taken in a water-jacketted Hempel gas burette, water being used as confining liquid, and the carbon dioxide absorbed by potassium hydroxide (one of potassium hydroxide to two of water) in a Hempel gas pipette containing several rolls of iron wire gauze. The gas was passed back and forth into the pipette ten times to make perfectly certain of complete absorption; only, however, when the caustic potash was nearly exhausted did any further contraction take place after the gas had been passed twice into the pipette. The temperature of the water in the jacket was kept within  $0.5^{\circ}$  of  $20^{\circ}\text{C}$ . Before taking the reading, the burette was allowed to drain for two and one-half minutes.

After measuring the contraction due to absorption of the carbon dioxide, the gas was passed into the phosphorus pipette to remove oxygen. The use of phosphorus gave a very valuable qualitative (as well as quantitative) test for oxygen, since less than 0.1 c.c. of oxygen in 100 c.c. of gas will give a noticeable white fume. The pipette was filled completely with slender sticks of phosphorus. The few instances in which oxygen was found in small amounts probably indicate slight contamination of the samples with air.

After the removal of oxygen, the gas was passed into a water pipette from which samples could be conveniently taken for the estimation of the saturated hydrocarbons. The latter were determined by the method of slow combustion described by Dennis.<sup>2</sup> The confining liquid used both in the combustion pipette and in the gas-burette employed in connection therewith was mercury, water having too great a solvent action on carbon dioxide. The burette was water jacketted, and the temperature of the water was kept within at least half a degree of  $20^{\circ}\text{C}$ .

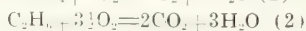
About 100 c.c. of oxygen were carefully measured and passed into the combustion pipette, then about 25 c.c. of residual gas were taken from the storage pipette, and its volume accurately read. The capillary connecting the burette and pipette was next cautiously freed from mercury and water, if any, the 110 volt current switched on, and the platinum spiral in the pipette brought to bright redness by cautiously manipulating a simple "nichrome" rheostat placed in series with a lamp resistance. The gas was now allowed to flow into the combustion pipette at the rate of about 10 c.c. per minute, the flow being controlled by a screw pinch-cock. The rate of flow permissible depends, however, very largely upon the form, size, position and temperature of the spiral, and possibly upon the shape of the pipette also. Combustion took place perfectly quietly. Great care must be taken to avoid shooting a single particle of mercury into the combustion pipette, since a drop striking the white hot wire will cut it like a knife. When all the sample had been run in, the gas was run backwards and forwards between the combustion pipette and the burette about fifteen times, not allowing the mercury to rise in the pipette to a point where the glass was at all hot. The current was now switched off, the pipette allowed to cool completely, the gas run into the burette, and the contraction in volume measured. The carbon dioxide was determined

<sup>1</sup> Dennis, loc. cit., p. 196.

<sup>2</sup> Dennis, loc. cit., pp. 147-154.

by absorption in caustic potash as described above, and the total volume of the paraffin hydrocarbons in the sample calculated from the formula  $V = \frac{2}{3} \frac{\text{T.C.} - \text{CO}_2}{\text{given}}$  by Dennis.<sup>1</sup> T.C. means "total contraction," and V stands for the volume of the paraffins.

Assuming methane and ethane to be the only hydrocarbons present, which was true for practical purposes in every case, we can calculate the percentage of each from the two combustion equations.



If, now, we let  $x = \text{c.c. CH}_4$  and  $y = \text{c.c. C}_2\text{H}_6$ , we can write

$$\text{CO}_2 = x + 2y \quad (3)$$

$$V = x + y \quad (4)$$

By subtracting (4) from (3) we get  $\text{CO}_2 - V = y$  (5)

From equation (4) we have  $V - y = x$  (6)

Let us take the figures obtained for duplicate samples of Kent gas number 4 to illustrate the solution of this problem.

	(1)	(2)
Volume of oxygen used in c.c. ....	100.0	100.0
Residual gas taken in c.c. ....	30.0	30.0
	130.0	130.0
Volume after combustion in c.c. ....	71.6	71.7
Total contraction in c.c. ....	58.4	58.3
Volume after absorption of $\text{CO}_2$ in KOH. ....	40.7	40.7
Carbon dioxide in c.c. ....	30.9	31.0
$V = \frac{2}{3} \text{T.C.} - \text{CO}_2$ ....	28.63	28.53
$y = \text{CO}_2 - V = \text{c.c. C}_2\text{H}_6$ ....	2.27	2.47
% $\text{C}_2\text{H}_6$ ....	7.6	8.2
$x = V - y = \text{c.c. CH}_4$ ....	26.36	26.06
% $\text{CH}_4$ ....	87.8	86.8

Since 0.5% hydrogen sulphide was present in this gas, the figures obtained for methane and ethane must be multiplied by  $\frac{99.5}{100}$

The nitrogen is determined by difference. We should like to have checked some of the nitrogen figures by burning the gas over red hot copper oxide and measuring the residual nitrogen left after absorbing the carbon dioxide in caustic potash, but the time at our disposal was too short. It must also be kept in mind that these figures for nitrogen include any of the rare gases such as helium and argon which may be present.

<sup>1</sup> Dennis, loc. cit., p. 131.

Analysis by Liquefaction<sup>1</sup>

The presence of propane or butane or both, in a gas containing methane and ethane, makes useless the results of the combustion method since only two values are obtained, the total contraction and the carbon dioxide, while there are three or four unknown quantities; the solution is therefore indeterminate. Until comparatively recently this difficulty has been insurmountable, but the attainment of very low temperatures by means of liquid air has opened up a new road for the attack of this problem.

Erdmann and Stoltzenberg<sup>2</sup> in 1910 described an apparatus adapted for this purpose and used it in the analysis of some simple gas mixtures.

Lebeau and Damiens<sup>3</sup> experimented with various mixtures of hydrogen and hydrocarbons using a different form of apparatus in which the mixtures were subjected to the low temperature of liquid air.

Burrell and Seibert, have also employed this method working along the same lines as Lebeau and Damiens. The sample was introduced into a cylinder immersed in liquid air, and as much gas as possible was removed by means of a mercury pump.

In the present investigation it was decided for convenience to employ the apparatus of Erdman and Stoltzenberg.

The hydrocarbons which are likely to occur in natural gas are:

	Boiling Point °C.
Methane .....	-160
Ethane .....	- 93
Propane . . . . .	- 45
Butane . . . . .	1

All these are therefore condensed to liquids at the temperature of liquid air, about -190° C., and the fractional distillation of the possible mixtures become a question of vapour pressures. At this temperature methane has a vapour pressure of about 8 cm., while the pressure of ethane is practically zero;<sup>3</sup> the higher hydrocarbons showing a behaviour similar to ethane. On subjecting a mixture of the above four paraffins to the temperature of liquid air, we should be able to remove the methane by pumping, leaving the three higher members as a liquid residue. Lebeau and Damiens<sup>3</sup> publish results showing a sharp separation of hydrogen and methane from ethane and propane, but we have been unable to secure equally satisfactory results.

In the present investigation, 100 c.c. of the gas were dried over phosphorus pentoxide and passed into a glass coil immersed in liquid air where liquefaction took place rapidly. After a few minutes the non-condensable gas was pumped off as completely as possible, which proved in some instances, to be a laborious operation. When no more gas could be obtained, the liquid air was removed, the condensate was allowed to gasify and was then measured. The non-condensable portion was again liquefied, and a second small condensate was thus obtained.

The entire fraction condensed was then analysed by the slow combustion method, and in some instances, the non-condensable portion also.

Circumstances would not permit the application of this method to all the samples taken, so that those which were high in ethane, as determined by a combustion on the whole sample, were selected. It is obvious that the presence of propane or butane or both in any gas, would lead, in the ordinary combustion method, to the conclusion that the amount of ethane present was higher than the real value, and hence those samples which were highest in ethane were examined first.

<sup>1</sup>As this article was passing through the press, a careful study of the method of analysis by fractional distillation at low temperature has been published by G. A. Burrell and F. M. Seibert in the Journal of the American Chemical Society, Vol. XXXVI, p. 1537.

<sup>2</sup>Ber. deutsch. chem. Gesell, Vol. XLIII, 1910, p. 1702, 1708.

<sup>3</sup>Compt. rend., Vol. CLVI, 1913, p. 325; Gas World, Vol. LIX, 1913, p. 325.

<sup>4</sup>Loc. cit., p. 91.

<sup>5</sup>Lebeau and Damiens. loc. cit.

	Ethane by combustion on whole sample.	Ethane, propane, etc., by liquefaction.
Kent No. 2 .....	10.8%	10.6%
Lambton No. 1 .....	17.6%	11.6%
Lambton No. 2 .....	18.4%	9.1%
Brant No. 1 .....	9.5%	7.8%
Brant No. 2 .....	19.0%	14.7%
Haldimand No. 2 .....	11.4%	10.8%
Haldimand No. 7 .....	16.3%	10.8%
Welland No. 1 .....	17.3%	15.6%
Haldimand No. 1 .....	21.3%	17.6%

It is unnecessary to give the details of the analysis of each of these condensates, but it will suffice to quote one for illustration.

In the case of Brant No. 2, the condensate yielded the following results:

	Sample No. 1.	Sample No. 2.
Volume of gas taken .....	14.4	15.0
Volume of oxygen added .....	98.8	99.9
Total volume .....	113.2	114.9
Volume after combustion .....	78.7	78.3
Contraction .....	34.5	36.6
Volume after potassium hydroxide absorption ..	51.7	50.1
Volume of carbon dioxide .....	27.0	28.2
Ethane .....	12.60	12.75
Methane .....	0.98	1.80

In all the condensates analysed only methane and ethane could be found, with the exception of Brant No. 1, Lambton 1 and 2, and Haldimand 1. Butane appears to be entirely absent in these gases.

Reverting to Brant No. 2, the above data furnish two concordant values, 12.60 and 12.75 per cent. of ethane in the gas, but these figures are much lower than 19.0, the percentage determined by combustion on the entire sample without liquefaction. A comparison of the values set down in the table shows that this is also the case in Lambton No. 1 and Haldimand No. 7, and we have endeavored to find some reason for these discrepancies. The condensations were usually carried out in duplicate and when some experience had been obtained, the volumes of condensate from two samples of the same gas did not vary by more than 1 c.c. on a 100 c.c. portion. A series of determinations were carried out on Welland No. 1 which was one of the first gases examined by this method, with the object of studying this difficulty; but no higher value for the condensate than that which is given above could be obtained.

The only explanation which we can offer to account for these variations is the well known fact that the vapour pressure of a liquid is altered by the addition of a second liquid; we have as yet no reliable method of calculating the amount of the change. The magnitude may be guessed from an observation that at  $-78^{\circ}\text{C}$  the vapour pressure of liquid isobutane is raised from 12.7 mm. to 19.9 mm. by the presence of 0.9% of propane.<sup>1</sup> While, therefore, pure ethane may at the temperature of liquid air have a vapour pressure of practically zero, the presence of a large quantity of liquid methane which is slowly being removed at each stroke of the pump, will almost certainly result in the evaporation of some of the liquid ethane also. It may at once be said that this error in parallel experiments might be expected to show a uniformity, and we have tried with the greatest care to realize this prediction but without success.

<sup>1</sup> Lebeau and Damiens, loc. cit.



In several cases the non-condensable gases were also analysed and proved to be mixtures of much methane and some nitrogen with small amounts of ethane. The quantity of the latter when added to that obtained from the condensate was still too low as compared with the value for ethane obtained by direct combustion.

Lack of time has prevented us from making a more thorough study of this problem.

The reason for the variations referred to above still remains undiscovered and the results actually obtained are given as a basis for the conclusions which have been drawn.

The data obtained by the liquefaction method, showing the absence of butane and higher homologues and the presence of propane in very small amount in only four samples, are taken by us to indicate the substantial accuracy of the combustion analyses. Any error which might be due to the presence of the higher paraffins may be regarded as entirely eliminated.

Note: It was the intention to carry out helium determinations on the most likely gases, i.e., the high nitrogen ones. It will be observed there were very few of these. Of two selected as promising one gave no helium and the other a distinguishable quantity. The rest of the highest nitrogen gases will be examined for helium later on.

TABLE I.  
ANALYSES ONTARIO NATURAL GASES  
Prof. W. H. Ellis, J. W. Bain, E. G. R. Ardagh, Chemists.

County and Well.	H <sub>2</sub> S	C <sub>2</sub> H <sub>4</sub>	CO	H	CO <sub>2</sub>	O	CH <sub>4</sub>	C <sub>2</sub> H <sub>6</sub>	C <sub>3</sub> H <sub>8</sub>	N	Con- dens- ate.	lbs. on well.
Essex No. 1.....	0.3	none	none	none	none	none	87.6	7.3	none	4.8	.....	50
Kent No. 1.....	trace	"	"	?	0.1	"	76.1	18.0	none	5.8	.....	565
Kent No. 2.....	0.3	"	"	none	none	"	84.4	10.8	"	4.5	10.6	522
Kent No. 3.....	0.6	"	"	"	0.1	"	86.0	8.5	"	4.8	.....	436
Kent No. 4.....	0.5	"	"	"	0.05	"	86.8	7.9	"	4.8	.....	400
Kent No. 5.....	0.4	"	"	"	0.3	"	83.4	10.6	"	5.3	.....	450
Kent No. 6.....	0.8	"	"	"	none	trace	78.2	15.7	"	6.1	.....	418
Kent No. 7.....	0.8	"	"	"	?	none	84.1	8.5	"	5.8	.....	519
Kent "Surface" Tp. Howard ...	none	"	"	"	none	"	83.0	none	"	17.0	.....	50?
aKent "Surface" Tp. Raleigh....	"	"	"	"	0.1	0.3	92.9	"	"	6.7	.....	?
Lambton No. 1 ...	"	"	"	"	none	none	68.3	12.5	3.4	15.8	11.6	830
Lambton No. 2 ...	"	"	"	"	"	"	69.0	15.7	1.8	13.5	9.1	830?
Lambton No. 3 ...	"	"	"	"	"	"	80.2	11.7	none?	8.1	.....	?
Elgin No. 1.....	"	"	"	"	"	"	84.1	10.8	"	5.1	.....	350
Norfolk No. 1....	"	"	"	"	"	"	84.4	6.8	"	8.8	.....	400
Norfolk No. 2....	"	"	"	"	"	"	83.8	7.7	"	8.5	.....	545
Norfolk No. 3....	"	"	"	"	"	"	75.8	14.2	"	10.0	.....	?
Haldimand No. 1..	"	"	"	"	"	"	67.8	16.0	3.5	12.7	17.6	275
Haldimand No. 2..	"	"	"	"	"	"	79.7	11.4	none	8.9	10.8	300
Haldimand No. 3..	"	"	"	?	"	"	76.7	14.6	"	8.7	.....	10
Haldimand No. 4..	"	"	"	"	"	"	81.4	11.7	"	6.9	.....	140
Haldimand No. 5..	"	"	"	"	"	"	79.4	14.3	"	6.3	.....	225
Haldimand No. 6..	"	"	"	"	"	"	81.8	11.8	"	6.4	.....	250
Haldimand No. 7..	"	"	"	"	"	"	76.6	16.3	"	7.1	10 8	285
Haldimand No. 8..	"	"	"	"	"	"	76.3	15.4	"	8.3	.....	250
Haldimand No. 9..	"	"	"	"	"	"	84.9	8.3	"	6.8	.....	87
Haldimand No. 10	"	"	"	"	"	"	77.6	15.4	"	7.0	.....	100
Haldimand No. 11	"	"	"	"	"	"	77.8	14.7	"	7.5	.....	100
Haldimand No. 12	"	"	"	"	"	"	80.0	11.4	"	8.6	.....	?
Wentworth No. 1.	"	"	"	"	"	"	80.2	13.1	"	6.7	.....	186
bBrant No 1.....	"	"	"	"	"	0.1	76.9	8.0	1.2	13.8	7.8	20
Brant No. 2.....	"	"	"	"	"	none	68.6	19.0	none	12.4	14.7	?
Brant No. 3.....	"	"	"	?	"	0.05	74.6	15.4	"	10.0	.....	?
Welland No. 1....	"	"	"	"	"	none	74.8	17.3	"	7.9	15.6	50
cWelland No. 2....	"	"	"	"	"	0.2	80.0	12.9	"	7.1	.....	100
Welland No. 3....	"	"	"	"	"	none	82.1	13.5	"	4.4	.....	100
Welland No. 4....	"	"	"	"	0.05	0.05	83.6	12.0	"	4.3	.....	120
Welland No. 5....	"	"	"	"	0.15	0.05	93.7	3.3	"	2.8	.....	50
Welland No. 6....	"	"	"	"	none	none	75.6	15.5	"	8.9	.....	185
Welland No. 7....	"	"	"	"	"	"	85.9	8.7	"	5.4	.....	6
York No. 1.....	Result given separately below											
York Scarboro Tp. "Surface".....	none	none	none	none	1.65	"	85.15	0.0	"	13.2	.....	5

(a) As this gas was probably in contact with water and might have taken oxygen from that, we cannot assume the O was due to sampling; no correction is, therefore, made. The sample was taken by displacing water.

(b) This is the highest O in any sample taken with water. The rubber tubing was blown off during operation; no correction made.

(c) Corrected to air free sample. Taken "dry."

Analysis of York No. 1 by Prof. E. G. R. Ardagh.

Carbon dioxide.....	0.1
Carbon monoxide .....	1.2
Ethane .....	3.1
Hydrogen.....	none
Hydrogen sulphide .....	none
Methane .....	86.0
Olefines .....	1.3
Oxygen.....	none
Nitrogen .....	8.3

100.0

Note.—The carbon monoxide and olefines appear in the analysis at the expense of the methane and ethane, but the relative proportions in which this took place are not known.

## COMPOSITION OF NATURAL GAS

By G. R. Mickle

## General Considerations

For convenience we may consider that there are three broad classes of natural gas, viz: (1) The "dry" commercial gases, that is, those that are found in such quantities that they are capable of utilization and are not intimately associated with oil; (2) The "wet" gases found in oil wells; (3) Those that are of no value, due either to lack of sufficient combustible constituents or their occurrence in insignificant quantities. It is the "dry" commercial gas with which we are concerned in Ontario, there being no evidence at present of the existence of "wet" gases in any important quantity.

Before proceeding further it may be as well to explain briefly the nature of the most important constituents, viz: the various hydrocarbons belonging to what are called the paraffin series or the saturated hydrocarbons which have the general formula  $C_n H_{2n-2}$ ; e.g. where  $n=1$ , formula is  $C H_{2-2} = CH_4$  and so on.

The only ones found in the dry Ontario gases are:

Methane ( $CH_4$ ) with heating power of 1067 B.T.U.

Ethane ( $C_2H_6$ ) with heating power of 1865 B.T.U.

Propane ( $C_3H_8$ ) with heating power of 2665 B.T.U.

B.T.U. standing for British Thermal Units per cubic foot of gas.

These data are taken from Thomsen's Thermo Chemistry, translated by Burke.

The only other constituent in natural gas having any heating value is hydrogen sulphide with 689 B.T.U.

The hydrocarbon series continues as follows:

Butane ..... ( $C_4 H_{10}$ )

Pentane ..... ( $C_5 H_{12}$ )

Hexane ..... ( $C_6 H_{14}$ )

Heptane ..... ( $C_7 H_{16}$ )

Taking all the reliable information available at present regarding the composition of the "dry" commercial gases, and it must be remembered that it is necessarily incomplete as it is not conceivable that all the variations and peculiarities in gas which may exist are known at the present time, we find that methane is the chief constituent, in some rare cases, perhaps, it is the only one, but usually with it are other hydrocarbon compounds, e.g. ethane or propane, and also, nitrogen, carbon dioxide and sometimes hydrogen sulphide. Many analyses published will show oxygen, carbon monoxide, olefines or illuminants, but the most reliable evidence points to the probability that these constituents never exist in natural gas. This matter is dealt with in the description of methods of analysis and need not be further alluded to here. None of these were found in any of the gases examined from Ontario. At the present as far as the writer can ascertain the maximum amount of the various constituents other than methane which are known to exist in "dry" commercial gases are as follows:

Ethane .....	27	per cent.	(a)
Propane .....	6	"	(b)
Nitrogen .....	46	"	(c)
Hydrogen-sulphide .....	0.8	"	(d)
Carbon dioxide.....	6	"	(e)
Helium .....	1.5	"	(f)

(a) Bull. 42, p. 87, U. S. Bureau of Mines. G. A. Burrell, Chemist.

(b) Bull. 42, p. 96, U. S. Bureau of Mines.

(c) Analysis No. 41, by Cady and McFarland, cited below among samples of gas.

(d) Analysis in present paper.

(e) Cady and McFarland, analysis No. 46, paper cited above.

(f) Cady and McFarland, analysis No. 41, given below.

These limits as stated before are certain to be extended by the analyses of gas discovered in the future. Extensions of these limits it will be seen can only increase the number of gases which may exist and therefore make the reasoning employed later on more forcible.

### The Mathematical Theory of Combinations Applied to Natural Gases

It is clear that "dry" commercial gas is not a chemical compound, but is a mixture of the above mentioned different gases, the relative proportions of which are not regulated by any chemical laws, but any one of the constituents mentioned, ethane, nitrogen, &c., may vary from zero to the maximum given above for each. The resultant natural gas is a combination of certain different gases and the number of combinations or the number of different natural gases which might exist is, therefore, capable of calculation by the ordinary mathematical laws, just as the combinations of any other kind of things. In order to estimate the possible number of different commercial gases which might exist in nature it is first necessary to determine the maximum variation which might occur in one and the same gas. The question of the probable identity or difference of any two given gases must be decided by the analyses and as these are subject to error the magnitude of the errors must be taken into consideration. The accuracy of the analyses, assuming of course, that all the work is performed skilfully and according to the best methods, varies greatly with the different constituents. For carbon dioxide probably within .1—.2 per cent, while with ethane or propane the error might easily be 1 per cent. The term "error" being used here in the technical sense in which it is employed by the authorities on the Method of Least Squares, meaning inaccuracies of measurement as opposed to "mistakes" which can be eliminated by proper checks. As nitrogen is nearly always determined by difference, the error in the nitrogen must be equal in magnitude and opposite in sign to the algebraic sum of all the errors in the other constituents. The errors in the carbon dioxide or hydrogen sulphide being insignificant compared with those in the determinations of the hydro-carbons, they may be disregarded, and we can assume that the magnitude of the nitrogen error is the same as for the hydro-carbons. In comparing any two analyses of different samples of gas it is of course possible that the errors might be in opposite directions and that gases which contained exactly the same percentage of ethane, for instance, might show an apparent difference of 2 per cent. if one has the maximum plus error and the other the maximum minus error of 1 per cent. The difference must therefore be twice the error plus some constant. The question is how to determine that constant. Two ways appear to be available. In the first place, we not unreasonably might expect to have some light on this question by studying the variations which are found to occur in artificial gas.

### Variations in Artificial Gas

The art of making artificial gas is about one hundred years old and those engaged in it have acquired an experience which ought to be of value with regard to variations. The usual practice is to deliver a gas to the consumer which is a mixture of coal gas and carburetted water gas. Each of these two in turn being mixtures of a number of gases. It is the coal gas which we will consider. This is made up mainly of methane and hydrogen, these two together accounting for about 80 per cent. or more of the total, the balance consisting of carbon dioxide, olefines, oxygen and nitrogen. Mr. Arthur Hewitt, General Manager of the Consumers Gas Co., Toronto, kindly furnished the writer with information regarding the variations in coal gas. The average daily amount of coal gas throughout the year made in these works is about 7 million cubic feet. The works are furnished with the very best equipment and every effort is made to deliver a uniform article. The coal gas, of which the analyses are given (Mr. Wilfred Philpotts, Chemist) is made in 300 retorts, which are fed regularly with carefully weighed amounts of the same material, the resultant gas from each retort is



thoroughly mixed with the product from the other retorts before the sample is taken. Disregarding the other constituents except methane and hydrogen the result of a set of tests extending over 24 hours was as follows:

Date, June 5 6, 1914

Time of sampling, 9.0-10.30 a.m.	10.45-11.30 a.m.	12.0-1.30 p.m.	2.0-4.0 p.m.	5.0-8.15 p.m.	
Methane.....	34.7	35.6	36.3	34.7	33.0
Hydrogen .....	44.2	44.4	42.1	46.5	46.9

That is, the maximum difference in methane is 3.3 per cent. and in hydrogen 4.8 per cent. The result of analyses made of samples taken at about regular intervals of a week were:

	Methane	Hydrogen
May 5th, 1914 .....	36.1	39.0
May 12th, 1914 .....	34.8	43.6
May 21st, 1914 .....	36.1	40.9
June 1st, 1914 .....	34.1	42.7

or a maximum variation of 2 per cent. for the methane and 4.6 for the hydrogen. Looking back over the records, periods of four weeks each gave maximum variations as follows:

Methane	Hydrogen
2.0.....	4.6
0.8.....	3.2
2.7.....	3.1
2.6.....	4.7

As explained before, this gas is obtained from 300 retorts. If there is any irregularity in any particular retort it ought to be equalized by the others. As far as it is possible to make it, this is one and the same gas, yet we see a variation of over 4 per cent. in some cases.

#### Determination of the Variations in Natural Gas by Inspection

By study of the variations in the things themselves we can arrive at an approximate estimate of the differences in percentage in one and the same gas provided there are a sufficient number of observations. Unfortunately the information on this point is meagre, still it appears to the writer that it can be approximately determined. Referring to the analyses given for Kent gas it will be seen at once that Nos. 2, 3, 4, 5, 7 are very similar. Both from the analyses and the results in the field one cannot doubt that these are one and the same gas. The highest ethane of these is 10.8 per cent. and the lowest 7.9 per cent., or an extreme variation of 2.9 per cent. For nitrogen similarly it is 5.8 per cent. and 4.5 per cent. or a maximum difference of 1.3 per cent. The mean of the ethanes in these 5 samples is 9.3 per cent., so that the extreme variation from the mean both plus and minus is about 1.5 per cent. No. 1 is evidently different, having practically no hydrogen sulphide, and 10 per cent. more ethane than any of the group mentioned. No. 6 has over 6 per cent. more ethane than the mean of those that are close in composition. If these seven gases represented by the samples were really variations of one gas there should be intermediate percentages of ethane, not a sudden transition. It will be sufficient to prove this once as the reasoning will be similar in every case. If analyses marked Kent 1 to 7 represent not different gases but one and the same body of gas varying from 7.9 to 18.0 ethane then must it be equally likely that any percentage of ethane between those limits will be found. Take first of all

the case of No. 6, with 15.7 per cent. ethane, and eliminating No. 1 for the present, the ethanes then are—(2) 10.8, (3) 8.5, (4) 7.9, (5) 10.6, (7) 8.5 and (6) 15.7. Take the highest and lowest of the group which are close together, viz.: 2 and 4, the difference between them is 2.9 per cent. Now take that as the unit and subdivide the interval between the highest and the lowest into units of this dimension. The first subdivision will take in percentages from 7.9 to 10.8, the second from 10.8 to 13.7, the third from 13.7 to 15.7 or an increase of 2 per cent. instead of 2.9. We have a total difference then of 7.8 per cent. Now by hypothesis, this being one and the same gas varying between the limits mentioned, the chance of any given analysis of this gas falling within any particular range of percentage is equal and proportional to the extent of the range, and these ranges of per cent. are expressed by the figures (1) 2.9, (2) 2.9, and (3) 2. Therefore, the chance that any given analysis will fall in the first range is represented by 2.9, in the second by 2.9, and in the third by 2, and it must fall in one of these subdivisions, and the sum of these or 7.8 represents certainty. The chance then, that any given analysis will fall in the first subdivision is 2.9 in 7.8 or 29 in 78. But we see that all five fall in this subdivision, and these are all independent events, the gas varying by hypothesis, therefore, the chance that all this series of events could happen under our hypothesis is  $\left(\frac{29}{78}\right)^5 = \frac{1}{222}$ . \*

We must conclude then that our hypothesis is wrong and that the gas represented by No. 6 analysis is not one and the same gas, but different from 2, 3, 4, 5, 7. If this can be proved for No. 6, much more easily can it be proved for No. 1, where the differences are much greater. We must assume, therefore, that something has happened to alter the composition of the gas in these two cases. In the case of Lambton Nos. 1 and 2, which are only about 700 feet apart, and therefore, one would expect them to be the same gas, the results are not as close as in other cases of adjoining wells. The presence of propane makes the exact analysis more difficult. Neither of the gases represented by Lambton Nos. 1 and 2 show any trace of anything besides the hydrocarbons and nitrogen.

This will be noticed throughout the whole set of analyses. Almost invariably the immediately adjacent ones which might naturally be expected to be the same gas are very close in composition. Careful examination of the analyses of Ontario gases appears to indicate that about 3 per cent. is the probable variation for one and the same gas as far as the hydrocarbons and nitrogen are concerned. Before proceeding further it would be well to see how this agrees with results obtained in other gas territories.

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\* For full explanation and proof, see Whitworth's "Choice and Chance." Pub. Deighton Bell & Co., Cambridge. Eng.



Parts of New York and Pennsylvania. From New York State Museum Map, Bulletin 160, and Pennsylvania Geol. Sur. Atlas. Position of Wells plotted from description in text of paper quoted

TABLE II.  
PENNSYLVANIA GASES.\*

	1	2	3	4	5	6	7	8	9	10	12	13	14	16
Carbon dioxide .....	.41	.30	.20	.21	.05	.28	Tr.	.44	.20	.52	3.64	.40	.41	.30
Carbon monoxide....	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ethane .....	Given with methane, &c., as paraffins													
Hydrogen .....	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydrogen sulphide ..	0	0	0	0	0	0	Tr.	0	0	0	0	0	0	0
Methane.....	Given with ethane, &c., as paraffins													
Olefines .....	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oxygen .....	Tr.	Tr.	Tr.	Tr.	Tr.	Tr.	Tr.	Tr.	Tr.	Tr.	0	0	0	0
Nitrogen .....	9.54	9.06	9.79	9.41	4.51	2.02	9.91	15.30	4.40	7.30	0	.70	12.32	7.10
Paraffins .....	90.05	90.64	90.01	90.38	95.44	97.70	90.09	84.26	95.40	92.18	96.36	98.90	87.27	92.60

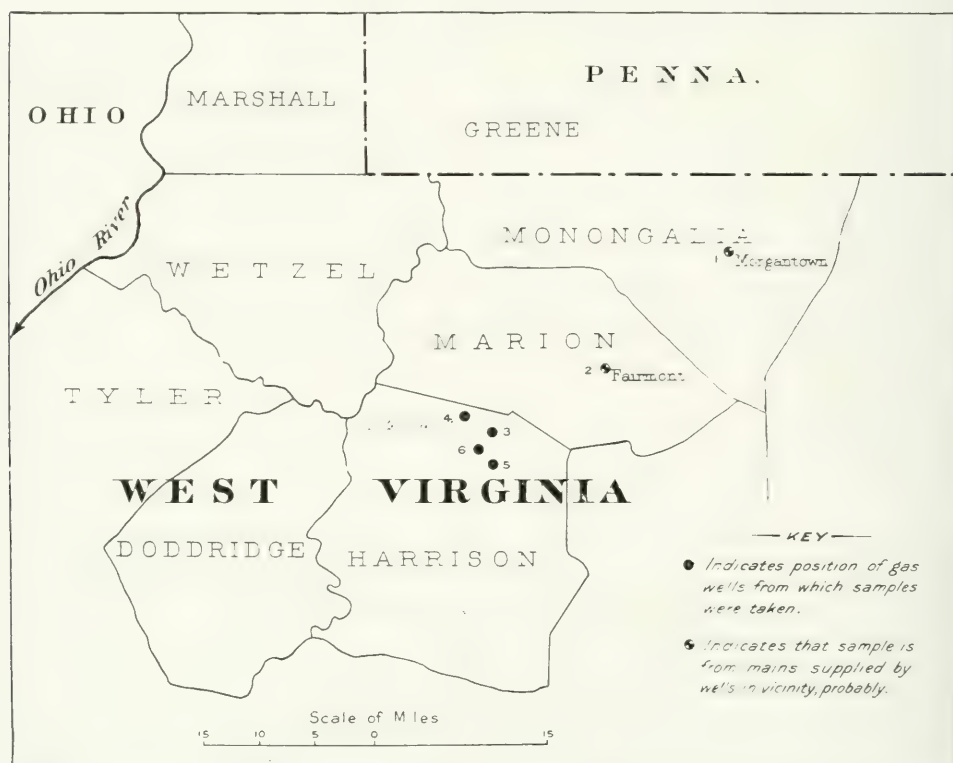
\*Chemist. F. C. Phillips.—From Am. Chem. Jour., Vol. XVI.

# Variations in Composition of Natural Gas in Other Fields

## Pennsylvania and West Virginia

The earliest systematic work on the composition of natural gas was done by Francis C. Phillips on the gases of Pennsylvania in 1886 and published in the Geological Survey Report of that State. In 1894 this was added to and the results given are taken from the Amer. Chem. Journal, Vol. 16. The numbers used in list of analyses are as given in that Journal. It will be noticed that some of the samples were mixtures from mains and therefore not of so much value for this purpose. Too much credit cannot be given Phillips for his contributions on the composition of gas. But for his work very little would be known now.

Referring to the analyses quoted from Phillips and other authorities, for the purpose of easy comparison, the different constituents are placed uniformly in alphabetical order. Maps have also been prepared in every case to bring out the relation between variations in composition and location from which the sample was taken more clearly. The methods of analyses have changed, and Phillips does not give methane and ethane, etc., separately, but calls them all paraffins. This does not make much difference for our purpose as we wish merely to note the variations, and as the determinations have all been made in the same manner, they are comparable. Taking the nitrogen as the best indicator, it will at once be seen that 1, 2, 3, 4 are very close together, but 1 and 2 being mixtures from different wells we cannot be certain whether there were variations in some of the constituents in opposite directions or whether the gas from each of the wells was the same. However, 3 and 4 agree very closely. The only one which disagrees substantially with those in the immediate vicinity is No. 13.



Portion of West Virginia reduced from map by West Virginia Geol. Sur. Vol. V. Position of Wells plotted from description in Vol. Ia, same Survey.



TABLE III.  
GASES FROM WEST VIRGINIA.\*

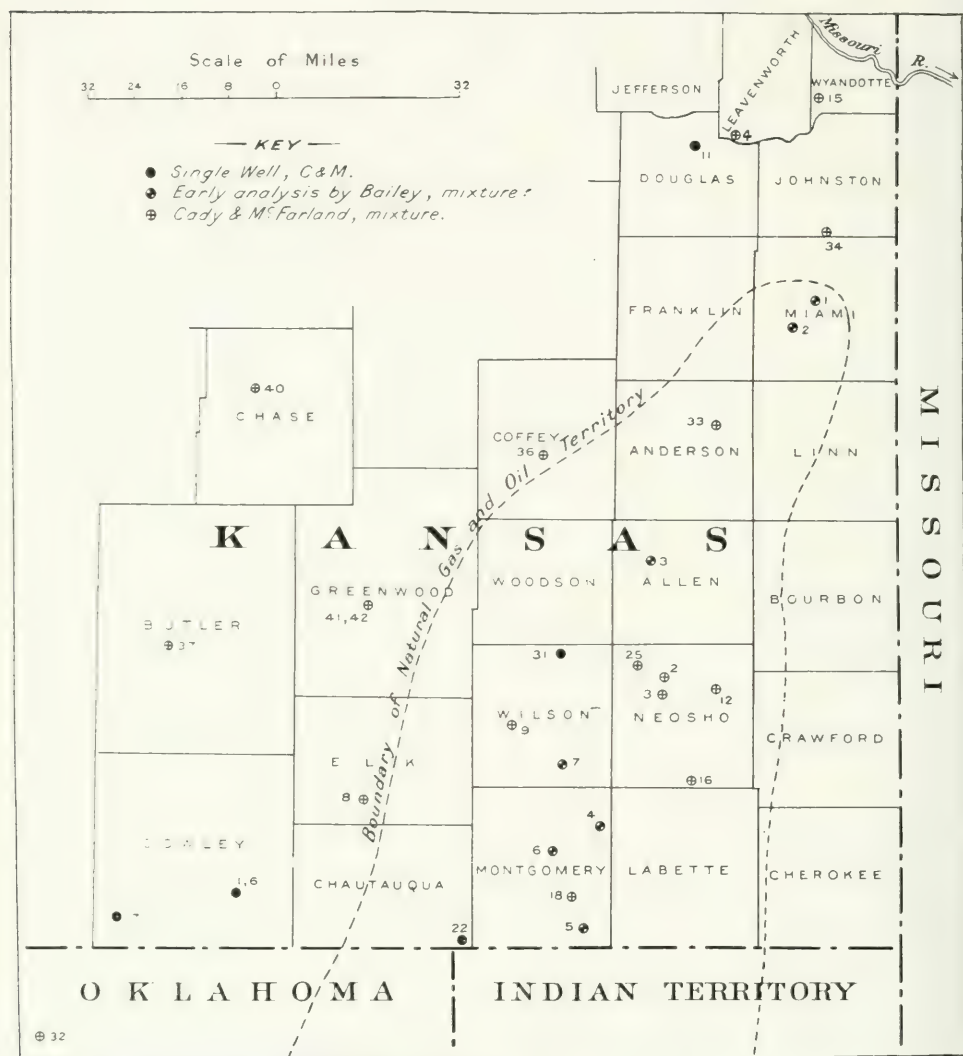
	1	2	3	4	5	6
Carbon dioxide .....	Tr.	.1	0	0	.1	0
Carbon monoxide .....	.4	.4	.4	.4	.4	.5
Ethane .....	14.60	14.09	15.09	14.88	14.35	7.65
Hydrogen .....	Tr.	.2	0	.1	.1	0
Hydrogen sulphide .....	0	0	0	0	0	0
Methane .....	80.94	81.60	79.95	80.85	80.70	86.48
Olefines .....	.4	.2	.4	.2	.1	.2
Oxygen .....	.2	.2	.2	.1	.3	.3
Nitrogen .....	3.46	3.21	3.96	3.47	3.95	4.87

\* Chemist, C. D. Howard.—From Vol. Ia West Virginia Geol. Sur.

Coming to West Virginia it will be noticed that 1 and 2 are mixtures, No. 1 being from Greene and Monongalia Counties. Nos. 3, 4, 5, and 6 are from single wells, and of these No. 6 differs by about 7 per cent. of ethane from the rest, and therefore, probably is a different gas. The variation in the others is less than 1 per cent. with the ethane. The top of various sands from which the gas came is given as 1421, 2199, 2380 and 1855 feet below the Pittsburgh Coal for 3, 4, 5 and 6 respectively. The gas territory extends throughout Monongalia, Marion, Harrison, Doddridge, part of Tyler and Wetzel, according to the report from which these analyses are taken. The results show the same features as those quoted from Pennsylvania, viz: Either close agreement or a substantial difference and therefore probably not a variation of one and the same thing between two extremes, but two different things. The proof would be the same here as illustrated above. Taking the ethanes again in 3, 4, 5 and 6 we have a difference of over 7 per cent between 3 and 6—this can be bridged as before by units covering the extreme range of the other three. To save calculation take 1 per cent. as the interval, then all three, i.e., Nos. 3, 4, 5 fall in this interval. As before the chance of this would be  $\frac{1}{7} \times \frac{1}{7} \times \frac{1}{7} = \frac{1}{343}$ . Therefore, as before, probably we have two different gases, not variations in one and the same gas.

#### Variations in Kansas Gas

The natural gases of Kansas have been thoroughly examined by Cady and McFarland and their results given in a paper entitled "Helium in Natural Gas and the Composition of Natural Gas" published in the Journal of the American Chemical Society, Vol. 29, II, and also in the University Geological Survey of Kansas, Vol. IX. This is a most interesting and invaluable paper and contains a wealth of information. The discovery of the rare gas helium which, as far as known, is only produced by the decay of radium, in comparatively large quantities—up to 1.8 per cent.—opens up an interesting field of speculation. In addition to this a great number of analyses of widely varying gases are given. For the purpose for which this paper is referred to, as an illustration of the variations which occur, it seemed advisable to plot the locations of all the samples on a map and to outline on this map the gas territory as it appeared to exist originally, especially as the writer wished to compare two sets of analyses, one of which was made in 1895 and was confined wholly to the area explored first. The location of all the samples of gas taken from within the area outlined and analysed by Cady and McFarland is shown on the map except in the case of a few where the approximate position of the wells was not given but merely the statement made that the gas was from certain mains without indicating the position of the wells. It will be noted that there were only two wells sampled within the area out-



Part of Kansas compiled from maps in Bull. 238 and 296 U.S. Geol. Sur. and Univ. of Kansas Geol. Sur. Vol. 9. Position of wells plotted from description in text of paper quoted.

TABLE IV.  
KANSAS GASES.

Single wells in gas area as outlined.			Analyses of mixtures in area outlined										Analyses of gas within area outlined on map of Kansas reproduced.									
* Cady & McFarland, Chemists.			* Cady & McFarland, Chemists.										† E. H. S. Bailey, Chemist.									
22	31	Aver.	2	3	9	12	16	18	21	25	33	45	Aver.	1	2	3	4	5	6	7	Aver.	
Carbon dioxide.....	.81	.0	.41	0	.20	.61	.33	.72	.92	.70	0	.20	1.94	.62	0.33	0.22	0.90	0.22	.00	0.44	1.0	.44
Carbon monoxide.....	0	.11	.05	0	0	0	0	0	.30	0	0	0	0	.03	.57	1.33	1.23	1.16	.91	.33	.50	.86
Ethane.....	0	.78	.39	0	0	0	4.26	3.37	0	0	0	.36	.75	.87	.....	.....	.....	.....	.....	.....	.....	.....
Hydrogen.....	0	.18	.09	0	Tr.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydrogen Sulphide.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.....	.....	.....	.....	.....	.....	.....	.....
Methane.....	92.4	96.2	94.3	98.0	98.06	82.25	90.30	91.9	95.7	91.50	94.7	94.3	94.3	93.10	95.20	97.63	89.56	92.46	96.41	95.28	90.56	93.87
Olefines.....	.1	.0	.05	.....	.....	.12	.30	0	.61	0	0	.16	0	.16	.11	.22	0	0	.35	.67	.22	.23
Oxygen.....	.15	Tr.	.08	.12	Tr.	Tr.	.22	Tr.	0	.40	.10	Tr.	.24	.10	.45	Tr.	.45	.22	.12	Tr.	.65	.27
Nitrogen.....	6.46	2.46	4.46	1.88	1.57	16.4	4.45	3.74	2.69	6.97	4.96	4.61	2.60	4.99	2.34	.60	7.76	5.94	2.21	2.28	7.07	4.03
Helium.....	.08	.27	.18	.....	.17	.62	.13	0.27	.08	.13	.24	.37	.17	.24	.....	.....	.....	.....	.....	.....	.....	.....

No. 45 not shown on plan. Wells were in Allen and Neosho Cos. No. 9 Wells from 2 to 7 miles E.S. and N.W. of position indicated on plan

\*From Jour. Am. Chem. Soc., Vol. 29, Part II.  
†From Bull. No. 238 U.S. Geol. Sur., and Univ. Geol. Sur., Kansas, Vol. IX.

lined, but these two do not differ much from one another, nor does the mean of the two single wells vary greatly from the mean of all the mixtures within the outlined area. For example, compare 4, 5 and 6 of Bailey's with 18 of Cady and McFarland's and 22 from a single well. The extreme variation in the nitrogen in the first three mentioned is 3.73 per cent. and in the latter two 3.77. There being tremendous variations in the nitrogen in Kansas, this similarity is the more striking. As these sets of analyses were probably not made in exactly the same way, they should rather be compared with one another than with the other set in order to estimate the variations.

### Calculation of the Probable Number of Dry Gases

Inspection of results of analyses available at present seems to indicate that a variation of more than 3 per cent. in any of the hydrocarbons or nitrogen and possibly 1.5 in the carbon dioxide in any two given gases makes it probable that they are different in origin or have suffered some change. We can now calculate the number of combinations possible or the number of different gases. As methane must be one of them as far as we know, and must make up the balance to 100 per cent. we can disregard it entirely in the calculation. If ethane may be present up to 27 per cent. and a difference of 3 per cent. in the ethane constitutes a different gas, then there must be nine possible different selections to be made from this constituent. In the same way two could be made from propane. Imagine now that gas could consist only of ethane and propane up to the limits mentioned along with the methane. Then, of course, each one of the nine different grades of ethane might combine with either of the two propanes and thus make 18 different gases. And any one of these 18 might be either with or without hydrogen sulphide, forming thus 36 different gases, and so on. The total number of combinations is therefore  $9 \times 2 \times 15 \times 2 \times 2 \times 3$  or 3240—ethane being allotted 9 different possible grades, propane 2, nitrogen 15, hydrogen sulphide 2, helium 2 and carbon dioxide 3.

While this is the possible number of combinations, the probable number is very much less. A scrutiny of the reliable analyses published will show that the ethane and the nitrogen do not often exceed 18 per cent.; propane is probably generally absent; the same holds for hydrogen sulphide. Carbon dioxide would most frequently be only capable of classifying as high or low, while helium is so seldom determined that we might as well disregard it altogether in considering the probable combinations. The probable number of gases would then be  $6 \times 6 \times 2 \times 2 = 144$ . This is assuming a range up to 18 per cent. for ethane and nitrogen and that either propane or hydrogen sulphide will be present in about half the gases and that carbon dioxide is graded either as high or low, probably 1 per cent. being considered high. The chance that any two gases will coincide in composition unless they are identical in origin and belong to, or once did belong to, the same body of gas, if that term may be employed, is 1 in 144. If their position is such that it is impossible they could have a common origin then something with less than one chance in a hundred has happened, and should make one look with suspicion on the circumstance.



### Probable Number of Different Gases in Ontario

Allowing the differences mentioned to exist in the same gas, it would appear that the various wells sampled should be classified as follows:

Essex 1 .....	=1?
Kent Nos. 2, 3, 4, 5, 7, all one .....	=1
Kent No. 1 .....	=1
Kent No. 6 .....	=1
Lambton 1, 2 .....	=1
Lambton 3 .....	=1
Elgin No. 1 .....	=1
Norfolk 1 and 2 .....	=1
Haldimand 2, 3, 4, 5, 6, 7, 8, 10, 11, 12 } Wentworth 1, Norfolk 3 .....	=1
Haldimand 9 .....	=1
Haldimand 1 .....	=1
Brant 1 .....	=1
Brant 2, 3 .....	=1
Welland 1, 6 ? .....	=1?
Welland 2, 3, 4 ? .....	=1?
Welland 5 .....	=1
Welland 7 .....	=1
York 1 .....	=1

Possibly only 15

18

The mean of all the ethane percentages in Haldimand, leaving out 1 and 9, is 13.7 per cent. None of them differ as much as 3 per cent. from that mean. Possibly Haldimand 7 and 8 should not be included with the others and it might be more correct not to consider Welland 1 and 6 and Welland 2, 3 and 4 as separate from the gases in Haldimand. In that case Welland 1 and 6 have been modified in some way.

## GENERAL DISCUSSION OF RESULTS OF ANALYSES

### Influence of Geological Formation

The analyses as far as the evidence goes do not appear to show that the geological formation in which the gas is found has any influence on the composition. In taking the samples from Welland County a special effort was made to ascertain this. Gas is found in four different rocks in that County, viz: the Clinton, average depth about 700 ft., Red Medina 765 ft., White Medina 810 ft., and Trenton. As many wells derive their gas from two or more of these sands, the drilling records were examined carefully to select wells which yielded gas in only one formation. Accordingly 1 and 2 were taken to represent the White Medina and 3 and 4 the Clinton, and 5 the Trenton. Red Medina was left for Haldimand County. But it is seen that No. 2 is similar to 3 and 4 and different from 1. Afterwards two more samples were taken in Welland—No. 6 in White Medina and 7 a mixture of Clinton and White Medina gas. If we conclude that the White Medina gas is higher in ethane than the Clinton basing that on 1 and 6, then the results of 2 are inconsistent with this. Moreover, No. 7 is lower in ethane than either of the other Clinton or White Medina gases, although it is a mixture of the two. No. 5, as explained before, is from the only well in the Trenton, consequently we cannot say whether the low ethane and nitrogen is due to the influence of the rock or its position. Coming into Haldimand, No. 1, the highest ethane.

is in White Medina; 7 and 8 are the next highest and are in Red and White Medina respectively. The lowest ethane in Haldimand is No. 9 in Red Medina, and so on—no definite differences.

In the western fields the gas is all obtained from one formation in the same field.

### **Influence of Declining Pressure on the Composition**

In the old field of Welland-Haldimand, etc., a number of wells which are almost exhausted were sampled purposely to see if there was any difference between the low and high pressure wells. The viscosity of a gas, or the measure of the difficulty with which it flows through an orifice of any kind, is supposed to vary directly with the square of the specific gravity, that is, the one with the higher density would find its way less readily through the pores and consequently we should expect the low specific gravity constituents to escape first, and, therefore, there would be a concentration of the higher density gases in wells that are nearly exhausted. Taking the specific gravities of the gases constituting natural gas, and it will be sufficient to use approximations. We have 0.6 for methane, 1.0 for ethane, 1.0 for nitrogen, and 1.5 for carbon dioxide; then the square of methane density is .36 and carbon dioxide 2.25 or methane should escape about six times as readily as carbon dioxide. Hence there should be a concentration of carbon dioxide in an old well. Unfortunately this latter gas which would be our best indicator is practically absent in the Ontario gases. Welland No. 5 is the only one in the eastern part showing more than a trace. Since this well has experienced the greatest drop in pressure of all—from 1,000 lbs. to less than 100—we should expect to see it higher in carbon dioxide, as indeed, it is, and also, higher in ethane and nitrogen. Actually it is lower in these latter two than any other of the gases in that vicinity. A careful scrutiny of the list of analyses of gas from Haldimand will show that there is no apparent concentration of ethane and nitrogen in the nearly exhausted wells. Of course we have no proof that all of them are not higher in these two gases than they were originally. This brings us back to the necessity of systematic sampling of the wells in any given field at different periods of its productive life if we are to acquire a complete knowledge of the composition. This was explained fully above.

### **Uniformity of Composition of Natural Gas in Ontario**

The most striking feature in the whole set of analyses is the wonderful uniformity of the gas derived from widely separated, and as far as the information from drilling goes, totally disconnected areas. For instance, the sample from the small field in Elgin which is 80 miles from the Kent field is almost identical with the normal gas from the latter area, the ethane being only 1.5 per cent. higher than the mean of normal Kent gas, and the nitrogen agreeing within .1 per cent. If a dash of hydrogen sulphide were added to this gas it would agree exactly with the Kent product, or conversely remove that fraction of one per cent. from the Kent and Essex gas and all these three would agree. Yet Kent is separated from Essex by twenty miles and Elgin from Kent by eighty. By the addition or subtraction of a very few per cent. of one or more constituents most of the apparently quite separate areas would be yielding the same gas. The almost complete absence of carbon dioxide in the Ontario gases is peculiar, only one sample in all the 27 examined from Elgin eastwards showing the small quantity of .15 per cent. and one a few hundredths of a per cent. An examination of the analyses quoted from other territories shows that carbon dioxide is more often present than not. When we consider that there are more than a hundred ways in which two dry commercial gases can differ and only one in which they can agree, this uniformity is surprising. It seems to be incompatible with a local and separate origin for each field. We can understand why the oxygen and nitrogen of the atmosphere are found in constant proportions in all parts of the world. There is only one atmosphere. Those who have theories to defend may be left to adjust them to the observed facts.

### Surface Gas

The occurrence of gas in the drift in many places in Ontario is of both economic and scientific interest. Analyses are given of this kind of gas from two different localities in Kent County and one in York. In one place as explained above, this gas has been in use for 21 years in several houses and shows no manifest sign of diminution. To form some idea of the quantity this involves the writer secured through the kindness of the Union Natural Gas Company which has a number of pipe lines traversing the County of Kent, an estimate of the average amount of gas consumed by a household in the territory they serve. Twenty farm houses were taken at random and the average amount of gas they use per year was ascertained. The price paid there is 15 cents per thousand feet and the average consumption is 220,000 ft. per year per household. In the County of Welland similar figures were obtained from the Provincial Natural Gas and Fuel Company, the average consumption per household came to 102,000 cu. ft. per year, the price of gas being 30 cents per thousand. There is no climatic or other reason except the price why the consumption should be higher in one place than the other. It is certain that households using gas which costs nothing will not consume less. The quantity is more likely to be 300,000 ft. per year or more, so that the total amount consumed by one of these houses in 21 years is probably 6 million feet or more.

All these gases examined contained over 80 per cent. methane and therefore probably have a calorific value of over 800 B.T.U. per cubic foot, methane having over 1000. The cheapest artificial gas sold in Ontario is in Toronto, where the price is 70 cents per thousand for a gas with a heat value of about 600 B.T.U. If one were buying this natural gas on the same basis, the price should be about 90 cents per thousand. It would no doubt be considered a boon in many houses if it could be delivered into the country at that price. A value of 50 cents per thousand could reasonably be put on this natural gas. This is equivalent to \$500 per million, so that the value to the households of the 6 million feet used is not less than \$3,000. As explained already, several farms in Howard Tp. have used this gas. There are also some in other parts of Kent County. The probabilities must be strong that there are a number of places in Scarboro Tp. also where a supply of gas could be obtained from the drift for years sufficient for individual houses provided reasonable economy is employed.

### Effect of Water on Natural Gas

As natural gas might come in contact with water in the drift, the possible effect of this on the composition should be considered. The facts given below are taken from Landolt u. Boernstein's Tabellen 4ten Auflage, and show the solubility of the various constituents of natural gas in water at various temperatures from 0° to 20° C. or 32° to 68°F. The amounts given are the number of volumes of the different gases soluble in one volume of water at different temperatures.

	0	5	10	20°
Oxygen .....	.0489	.0428	.038	.031
Nitrogen .....	.0239	.0215	.019	.016
Carbon dioxide .....	1.713	1.424	1.194	0.878
Methane .....	.055	.048	.042	.033
Ethane .....	.099	.080	.066	.047
Hydrogen sulphide .....	4.686	4.063	3.520	2.672



It is seen at once that carbon dioxide and hydrogen sulphide are vastly more soluble than the other constituents of natural gas, which do not differ greatly in this respect and consequently water could not change their relative proportions materially. Water saturated with carbon dioxide at a temperature just above zero should release some of this in percolating downwards owing to rise of temperature. Consequently if drift gas comes in contact with water we must expect carbon dioxide.

### Oxygen in Water and Natural Gas

The behavior of oxygen in water may throw some light on the absence of this constituent in natural gas. Thorpe's Dictionary of Applied Chemistry under "Water" gives the amounts of nitrogen, oxygen and carbon dioxide present in rain water as 1.308, 0.637 and 0.128 per cent. respectively, and in discussing drinking waters it is said: "The gases present in ordinary drinking waters are those of the atmosphere, oxygen, nitrogen and carbonic anhydride (carbon dioxide). Their quantitative determination is rarely made as they are of little or no significance in connection with the quality of water for drinking, excepting that through the absence of the dissolved gases a water has the flat taste of that which has been recently boiled. It is sometimes supposed that the absence of a due proportion of dissolved oxygen in water is an indication of the presence of decomposing organic substances, but this can only be the case with surface waters, as the very purest subterranean waters are almost destitute of it." The purest waters are those that have percolated most, the oxygen being so active attacks different compounds in the soil and is eliminated. If it is thus removed from water it seems likely that even if there were oxygen in gas when it is formed it would be removed in the same way.

### Relation of Surface Gas to the Deep Rock Gas

Whether this "surface" gas has escaped from below or been formed in the drift, its composition is worth investigation. If it comes from below, unless it can be shown that the composition could be altered in some way there should be an agreement. As pointed out already in the discussion of the deep rock gases, there does not appear to be any reason why we should believe that the differences in specific gravity of the various constituents of natural gas have caused a concentration of the higher density ones. As has been explained already, evidence on this point is not complete and definite. An effort was made by the writer to secure samples of "surface" gas over known gas producing rock, but unsuccessfully. According to the drillers, gas is found in the drift frequently in drilling in the Kent field, possibly something like one-third of the wells showing it. At the time the samples were being collected none was available.

### Influence of Drift or Surface Gas on Theories of Origin of Natural Gas

It is evident on reading the literature in connection with natural gas that the existence of a combustible substance in the drift in many places has profoundly influenced the course of thought on this subject. The method of reasoning is plain and convincing. The formation of marsh gas in swamps, or wherever vegetable matter decomposes under water, is familiar to every one. Add to this the existence of gas in the drift ascribed naturally to the decomposition of the vegetable or animal matter covered by the drift. With this simple process before our eyes why seek further for an explanation of the origin of the normal deep rock gases? Turning to our list of analyses given there are three of surface gases and thirty-nine of the deep rock product. It will be noticed at once that every one of the deep gases contains ethane while all the drift gases are entirely free of it. This might be chance of course, and we cannot prove that it is not, but the degree of probability can be determined and it will be worth while to calculate this chance and express it definitely in figures. It can readily be done in this way. Let it be assumed that all these gases represented by the 42



analyses and found in the same territory were formed in the same way out of the same things. Then must they consist of the same things. It is obvious that unless they do there is no point in mentioning the existence of drift or surface gas in connection with ordinary natural gas. Now we have seen already that the analyses given of the deep gases represent probably at least 15 different gases, and of course, it is obvious that it is the number of different deep gases which is of importance here as even an infinite number of analyses of one and the same gas could not affect the argument. We have then 18 gases in all, of which 15 have already been shown to be probably different, and the three surface gases from their position must clearly be separate bodies of gas and, therefore, the formation or determination of their constituents must have been caused by independent events. Now, as there are three gases out of the 18 which have no ethane, and these gases being all the same in origin by hypothesis, the chance that any given gas will not contain ethane is 3 in 18, or 1 in 6, or  $\frac{1}{6}$ . The chance that all three surface gases would be devoid of ethane is, therefore  $\frac{1}{6} \times \frac{1}{6} \times \frac{1}{6}$ , or  $\left(\frac{1}{6}\right)^3 = \frac{1}{216}$ , these being as we have seen all independent events. The mathematical proof of this is fully dealt with in Whitworth's "Choice and Chance," already referred to in a chapter dealing with series of concurrent events. Now the chance that any given one of our eighteen different gases under consideration will contain ethane, is, of course,  $\frac{15}{18}$  or  $\frac{5}{6}$ , and the chance that all our fifteen deep gases will have ethane is  $\left(\frac{5}{6}\right)^{15} = \frac{1}{15}$  approximately. Therefore, the chance that the whole series of events would happen as it did, is, under our hypothesis,  $\frac{1}{216} \times \frac{1}{15} = \frac{1}{3240}$ . But the events did occur, therefore the amount just found represents the chance that the hypothesis is right.

The nature or composition of surface gas being such an important link in the chain of reasoning regarding the origin of natural gas it is surprising that no analyses are given in support of the theories. The authorities have decided how it is made before ascertaining what it is. And yet, it seems more logical to find out first the thing which is capable of accurate determination. If we know what natural gas is we are more likely to arrive at a correct idea of how it was made. The writer has only been able to find two analyses of gas from the drift in literature. Both of these are in Cady and McFarland's admirable and elaborate review of analyses of natural gas.<sup>1</sup> One of these is not expressly stated to be drift gas, but from the description probably is, as it is recorded that the gas was obtained from a pipe driven down 210 feet through clay. An analysis by Dr. Rollin Chamberlin of a sample obtained at Princeton, Ill., follows:<sup>2</sup>

Carbon dioxide .....	0.10
Carbon monoxide .....	0.05
Oxygen .....	0.05
Methane .....	13.97
Nitrogen .....	85.83
	<hr/>
	100.00

Compare with the analysis given below of a similar high nitrogen gas from Dexter, Kansas, with 1 per cent. ethane and also 1.6 helium. The ethane is small here; with over 80 per cent. nitrogen there is not much room for anything else. The other analysis

1. University Geol. Sur. of Kansas, Vol. IX.

2. Ibid, pages 251-2.

is of a drift gas from Dawson, Iowa, quoted by the above mentioned authors from Eighth Ann. Rep. Iowa, Geol. Survey:

Hydrocarbons and nitrogen .....	95.35
Carbon monoxide .....	2.50
Carbon dioxide.....	1.60
Oxygen .....	0.55
	<hr/>
	100.00

This is an entirely useless result for any purpose whatever. If it is intended to show the fuel value it makes quite a difference how much nitrogen there is. It looks as if the three constituents mentioned last in the analysis had been determined and the rest is by difference. The only constituent we can rely on as probably correct is the carbon dioxide. This analysis is fairly typical of the amount of intelligent attention that has been devoted to the composition of drift gas. Of course, our old friend Oxygen must be in it too. There is a real significance in this. It has already been shown in the description of mode of sampling that the diffusion of air and gas in the holder is not according to theory at all. If we are unable to forecast what will take place in an insignificant tube that can be held in the hand where only one operation is involved, what chance is there that we can decide on what has taken place over hundreds of square miles, and where more than one operation is concerned? Yet the analysis will show within a few hundredths of a per cent. how much oxygen is in the tube and consequently to what extent the theory of diffusion has failed. And so, on the larger scale, it is possible to determine after a while exactly what the composition of gas is. Whether it is of organic or inorganic origin, and it must be one of the two, or both combined, it must have been made by chemical processes which have produced the resultant gas. An accurate knowledge of the composition of this resultant cannot fail to aid in arriving at a correct conclusion with regard to origin. At any rate, it will weed out some of the theories proposed which will be a benefit and we will have the satisfaction of having made an intelligent effort to solve the mystery.

### Miscellaneous Analyses of Natural Gas

There is very little satisfaction in studying lists of analyses of natural gas available at the present time. Sufficient care is generally not taken with one or more of the following factors, viz., with regard to selection of place from which the sample is taken, or mode of taking it, or method of analysis. All due to the fact that the authorities on natural gas have attached very slight importance to the composition. There is little to be gained from comparing results obtained in a different way. Accordingly only a few are produced below for illustration:

#### Kansas Gas

Analysis No. 41, Cady & McFarland, Kansas gas shown on plan.

Carbon dioxide .....	0.20
Carbon monoxide .....	0.00
Ethane . . . . .	.00
Methane . . . . .	51.80
Nitrogen . . . . .	46.40
Helium . . . . .	1.50
Oxygen . . . . .	.10
	<hr/>
	100.00

## Wyoming Gas

Gas from Greybull, Wyoming (A. G. Burrell, Analyst), Technical Paper No. 57. U.S. Bureau of Mines.

Carbon dioxide .....	0.20
Ethane . . . . .	17.35
Methane . . . . .	81.70
Nitrogen . . . . .	0.75
	<hr/>
	100.00

The well drilled at Kissarmas in Hungary is most interesting. This was started in the hope of finding potassium salts. A full account is given in a report published by the Hungarian Finance Ministry. "Bericht Ueber die Resultate der bisher zur Erforschung der Erdgasvorkommen des Siebenbuerger Beckens vorgenommenen Untersuchungen," Budapest, 1911. Franz Boehm, the Engineer under whose direction the work was carried out, gives the following details:

Work started 26th Nov., 1908.

Small amount gas found at 70 ft.

Larger amount gas found at 376 ft.

*Strong flow* at 680 ft. (30th Jan., 1909.)

The pressure was then 450 lbs. (30 atmos.) and the capacity 3,100,000 cubic feet in 24 hours. An analysis of the gas at this time by Prof. Ignaz Pfeifer showed 99.25 per cent. methane and .75 nitrogen. The well was continued to a depth of 993 feet, when the pressure was 750 lbs. An analysis of the gas by Prof. Schelle at this stage gave:

Methane .....	99.0
Nitrogen .....	0.2
Hydrogen .....	0.4
Oxygen .....	0.4

Well stopped April 22nd, 1909. Capacity at this time 32,000,000 feet.

The rocks in which gas was found were clayey marls and sandstones of the Miocene age. They were unable to close the well for some time and gas was wasting for 2½ years. (Jour. für Gasbeleuchtung Nr. 51 S 1251 Münnchen).

## Gas From Russia

## Baku, Russia

Hydrogen .....	0.98
Methane . . . . .	93.09
Ethane . . . . .	3.26
Carbon dioxide .....	2.18
Nitrogen . . . . .	0.49
	<hr/>
	100.00

The analysis is from Lewes "Liquid & Gaseous Fuels," p. 46, chemist not known.

### Examples of Analyses of Natural Gas Showing Oxygen

In boring for water at Neuengamme near Hamburg, Germany, gas was found at a depth of 808 ft. Analysis No. 1 of this gas is by the Hamburg Hygienic Institute. No. 2, which was taken 23 days later, was by the Hamburg Gas Works.<sup>1</sup>

#### Neuengamme, near Hamburg

	1	2
Methane . . . . .	91.5	91.6
Olefines . . . . .	2.1	0.8
Nitrogen . . . . .	5.6	4.4
Oxygen . . . . .	1.5	0.7
Carbon dioxide . . . . .	0.3	0.2 also H <sub>2</sub> S.
		Hydrogen 2.3
	101.0	100.0
Helium .01—.02 per cent.		

#### Gas from Smithfield, Utah.<sup>2</sup> Prof. Kingsbury, Chemist

#### Pittsfield Gas, Pike Co., Ill. (Chemist not given)

Carbon dioxide . . . . .	.8	Carbon dioxide . . . . .	.81
Carbon monoxide . . . . .	1.2	Oxygen . . . . .	3.46
Ethane . . . . .	37.8	Methane . . . . .	73.81
Hydrogen . . . . .	16.6	Nitrogen . . . . .	21.92
Methane . . . . .	22.3		
Olefines . . . . .	0.7		100.00
Oxygen . . . . .	0.9		
Nitrogen . . . . .	19.7		

This list could be indefinitely extended.

### Analyses Illustrating Composition of Gas from Oil Wells and "Wet" Gases

The following analyses are taken from Technical Paper No. 57, U. S. Bureau of Mines. A. G. Burrell, analyst.

#### Oil Well at Byron, Wyoming

#### Salt Creek Field, Wyoming

Carbon dioxide . . . . .	= 0.47	. . . . .	.0
Methane . . . . .	= 64.05	. . . . .	.0
Ethane . . . . .	= 32.28	. . . . .	60.40
Propane . . . . .	. . . . .	. . . . .	10.63
Nitrogen . . . . .	= 3.20	. . . . .	28.97
	100.00		100.00

In Bulletin 42 loc. cit., A. G. Burrell gives analyses of "wet" gases showing the following maxima:

For propane, 88.3 per cent.

For ethane, 96.1 per cent.

For butane, 40.6 per cent.

Methane is sometimes entirely absent.

<sup>1</sup>Translated from "Ueber den Helium und Argongehalt des Erdgases von Neuengamme" by A. Voller und B. Walter, Jahrbuch der Hamburgischen Wissenschaftlichen Anstalten XXVIII, 1910.

<sup>2</sup>From Bull. 260, U. S. Geol. Sur., p. 481.

<sup>3</sup>From Illinois State Geol. Sur. Bull. 2, p. 82.



## Incombustible Natural Gases

The following analyses are by Cady & McFarland. (Position shown on plan.)

	No. 1	No. 6
Carbon dioxide . . . . .	0.	0.
Carbon monoxide . . . . .	0.	0.
Ethane . . . . .	0.41	1.06
Hydrogen . . . . .	tr.	tr.
Methane . . . . .	14.85	14.33
Olefines . . . . .	0.	0.
Oxygen . . . . .	0.2	0.1
Nitrogen . . . . .	82.70	82.87
Helium . . . . .	1.84	1.64
	<hr/>	<hr/>
	100.00	100.00

Burrell states that he has found 98 per cent. of nitrogen in a natural gas from Washington and 30 per cent. of carbon dioxide in California gas. (Journ. Ind. Eng. Chem. Vol. 4, 1912, p. 615). It is evident that if the "wet" gases and the incombustible ones were considered, the total number of gases must be vastly greater than calculated above.



# INDEX VOL. XXIII., PART I

	PAGE
Aaron, E. ....	76
Aatanasoff, S. ....	78
A. B. P. Mining Co. ....	173
Accidents	
Caused largely by foreigners. .1, 2, 186	
Michipicoten div. ....	113
Report on ....	53-109
Acetate of lead.	
For sampling natural gas ....	240
Acme gold mine ....6, 7, 157, 158	
Acme Gold Mines, Ltd. ....	10
Actinolite, Ont. ....	184
Actinolite production ....	5
Acts of Parliament.	
Bonus for finding radium ....	42
Eight-hour Act ....	73
Metal Refining Act, ref. to ....	20
Mining Act, <i>re</i> explosives ....62, 63	
prosecutions under ....	68
Mining Tax Act ....	39, 40
Adams, A. C. ....	187
Adams, J. ....	84
Adamson, William ....	23
Adelaide Mining Co. ....	173
Agmoinin, A. ....	88
Agnew, J. L. ....	113
Air in natural gas, trouble with ....	239
Alabastine Co. of Paris, Ltd. ....	31
Accident at plant. ....	76
Work by ....	188
Aladdin (Silver Queen) Cobalt silver mine ....11, 17, 19, 130	
Albino, P. ....	104
Aldrich Gas and Oil Co. ....	37
Alexander, Alex. ....	27
Alexandra silver mine ....74, 84	
Alexo Mining Co. ....	42
Alexo nickel mine ....20, 47, 167	
Algoma dist., geology of ....203-236	
Algoma Eastern railway, rocks along	221
Algoma Land Co. ....	42
Algoma Mills ....226, 233	
Algoma Mining div.	
Sales and leases ....	39
Algoma Steel Corporation ....22, 31	
Accidents to employees ....92, 96, 98	
Goudreau mine owned by. ....113, 124	
Officers of ....	124
Pulmotor used by ....	70
Safety engineer proposed for. ....113	
Work by ....	124
<i>See also</i> Helen mine and Magpie mine.	
Algomian formation ....202, 203	
Allan, J. G. ....	33
Allard, G. E. ....	34
Allen, F. B. ....	184
Allen, Solomon ....	23
Alphonse Custodis Chimney Construction Co. ....	121
Alsip Brick & Tile Co. ....23, 110	
Alvano, P. ....	88
Amalgamated Nickel-Copper Mfg. Co. ....	41
Amphibolite in Sudbury region ....	209

	PAGE
Analyses.	
Brine ....	46
Coracite ....	44
Iron ore ....	181
Limestone ....209, 220	
Natural gas, methods of taking. ....	247-253
Ontario ....	254
Germany ....	272
Hungary ....	271
Russia ....	271
United States. ....259, 261, 263, 270, 272	
Anderson, M. ....	80, 82
Angelo, C. ....	100
Angelo, D. ....	100
Angelo, L. ....	102
Angelo, M. ....	102
Animikie formation.	
Description ....	236
L. Huron, north of ....203, 206	
Relation of, to Huronian ....	234
Thunder bay ....	235
Annis, George ....	27
Antonio, B. ....	100
Antonio, T. ....	100
Antono, M. ....	80
Appleyard, Albert ....	27
Ardagh, Prof. E. G. R. ....	246
Paper by, on The Analyses of Gases ....247-254	
Arkose at Copper Cliff. ....211, 212	
Armstrong, George H. ....	23
Armstrong Supply Co. ....30, 193	
Arnold, Willard ....	23
Arsenic.	
Cobalt ores, percentage of ....	15
Producers ....	31
Production ....	3-5
Arsenical pyrites.	
Foster tp., S. of ....	214
Artificial gas. <i>See</i> Gas, artificial	
Artivio, G. ....	82
Arturo, T. ....	108
Arveson, A. B. ....	185
Asbestos in Porcupine dist. ....	47
Ashbridge Brick Co. ....	23
Askew, J. W. ....	243
Associated Gold Mines of Western Australia, Ltd. ....	42
<i>See also</i> Keeley silver mine.	
North—Thompson gold mine.	
Atikokan.	
Gold mining at ....6, 10	
Atikokan Iron Co. ....	22
Atkinson, M. ....	98
Atkinson, Magistrate ....	68
Australia.	
Carnotite ....	44
Silver production ....	14
Austria, pitchblende in ....	44
Autunite, notes on ....	44
Avicksonin, A. ....	78

	PAGE
Aweres tp., iron.....	207
quartzite.....	229
Ayotte, E. ....	88
Babaneo, F. ....	88
Baby, M. ....	102
Bacowski, L. ....	100
Baeckler, William ....	23
Bahonen, S. ....	102
Bailey, E. H. S. ....	263
Bailey Cobalt silver mine.	
Accident at .....	76
Producing .....	11, 19
Work at .....	130
Bain, J. W. ....	
Paper by, on the Analyses of Gases.	247-254
Baird, Frank B. ....	187
Baird & Son, H. C. ....	23
Bakanerski, L. ....	86
Baker, F. J. ....	76
Baker, George E. ....	23
Baker, L. S. ....	243
Baker Bros. ....	23
Baku, Russia ....	271
Balcom, R. ....	244
Baldwin, H. ....	243
Ball, M. A. ....	27, 28
Ballantyne, James ....	184
Balmy Beach Land Building Co. ....	42
Balsam Lake Quarries, Ltd. ....	41
Bancroft, J. A. ....	230
Bancroft, marble quarry near ....	170, 182
Bannerman and Horne ....	29
Barcouch, N. ....	88
Bardyck, P. ....	78
Barlow, Dr. A. E. ....	201, 204, 211
Barnes, William ....	30
Barodine, F. ....	86
Barrie tp. ....	173
Barscon, J. ....	80
Bartollotti, A. ....	78
Barton Pressed Brick Co. ....	193
Barton tp. ....	190, 191
Bartonville Pressed Brick Co. ....	23, 193
Baruyne, B. ....	88
Barwick Mines Co. ....	41
Bassett, A. ....	80
Bassette, E. ....	155
Bastard tp. ....	185
Battersby, W. F. ....	159
Battle, John ....	30
Battle quarry, Thorold ....	189
Bausch, Filis ....	71
Bay of Islands, L. Huron ....	222
Bayham tp., gas in ....	244, 254
Beachville White Lime Co. ....	27
Beacon Oil Co. ....	42
Bear lake, S. of Penage lake ....	221
Beatty farm, Sydenham tp. ....	190
Beatty tp. ....	49
Beaver Auxiliary silver mine ....	154
Beaver brand fuse ....	67
Beaver Consolidated silver mines.	
Accident .....	76
Dividend .....	17
Mill capacity .....	129
Officers .....	130
Production .....	11

	PAGE
Work at .....	133
Beaver Oil and Gas Co. ....	37
Beaverhouse lake, McVittie tp. ....	9
Beaverton Clay Products Co. ....	23
Beck & Aitkens ....	37
Beckett, E. C. ....	23
Bedard gold claim, near L. Penage..	220
Bedford tp., mica .....	34, 178
feldspar .....	171, 177
Beebe, Geo. H. ....	154
Beechville .....	192
Behenna, J. ....	82
Belanger, E. ....	88
Belknap, S. F. ....	182
Bell, John H. ....	23
Bell, M. G. ....	190
Bell, Dr. Robert	
Ref. to work by, N. of L. Huron..	204, 208, 211, 219, 221, 222, 234
Bell, T. E. ....	98
Bell Bros. ....	23, 186
Bell Bros. & Co. ....	23
Belleville.	
Assay plant removed from .....	49
Cement plant near .....	30
Electric furnace at, description. ....	179-182
Belleville Pottery Co. ....	23
Bellio, E. ....	104
Belmont iron mine .....	22, 171
Belmont tp., trap rock quarry.....	184
Bemrose, Thos. ....	23
Ben Allen Portland Cement Co. ....	30
Bendigo, Australia.	
Miner's phthisis .....	70
Bennett, A. G. ....	183
Bennett, Robert .....	38
Bennett, W. ....	88
Bennett, Son & Co., Wm. ....	67
Bennetts, J. ....	84
Benson, G. A. ....	130
Berarino, F. ....	80
Bergin, Patrick .....	27, 28
Berich, J. ....	76
Berlick, J. ....	84
Bertie Natural Gas Co. ....	37
Bertie tp., gas in .....	36, 245, 246
analysis .....	254
notes .....	244
Bessemer iron mine, accident .....	76
work at .....	172
Bethel, H. ....	104
Bickell, J. P. ....	163
Bickford, Smith & Co. ....	67
Big Four Brick Co. ....	23
Big Vermilion lake. <i>See</i> Northern Pyrites Mine.	
Bilenas, M. ....	80
Billy, P. ....	80
Binbrook tp., gas in .....	36, 245
analysis .....	254
Biotite-garnet schist.	
Sudbury reg. ....	209
Birch Lake Mining Co. ....	34, 42
Birloska, Yam .....	98
Birnorsink, U. ....	84
Bishop, F. J. ....	136
Bissett, G. W. ....	219
Black Donald Graphite Co. ....	33, 178
Black Fox Gold Mining Co. ....	41



	PAGE
Blackwell, J. ....	104
Blain, Hugh ....	134
Blairton iron mine ....	171
Blake, Elias D. ....	23
Blake, James ....	188
Blake, W. C. ....	23
Blanchard, C. ....	76
Blast furnaces.	
Accidents at ....	94-104
Deseronto, rebuilt ....	182
Parry Sound ....	182, 187
Work at, report on ....	187, 188
Blezard nickel mine.	
Norite ....	200
Sudburite near, analysis ....	217
Blind River, Alg. ....	227
Bloom lake ....	156
Blue lake, Dumfries tp. ....	30
Boehm, Franz ....	271
Bogart Bros. ....	23
Bohemia, pitchblende in ....	44
Boiullia, J. ....	100
Bojco, N. ....	86
Bojuk, G. ....	100
Bolechione, R. ....	98
Bond & Bird ....	23
Bonis, David ....	192
Bonis, John ....	192
Boone, George H. ....	23
Booth, C. D. ....	155
Borich, J. ....	76
Borings for gas, Enniskillen tp. ....	36
Gov't revenue from ....	38
for nickel, Levack tp. ....	194
Bosmavinuk, F. ....	78
Bossack, A. ....	102
Bossell, Karl ....	78
Bothwell oil-field.	
production ....	34, 35
Bounties on cobalt and nickel ....	20
Bowels, J. ....	102
Bowker, S. T. ....	48
Bowler, Wes. ....	23
Bowman, C. ....	179
Boyce, E. ....	88
Boyd, W. ....	100
Boyer lake ....	127
Boyuck, G. ....	104
Brackenbury, C. ....	216
Paper by, on Rocks of Levack tp. ....	194-201
Brampton Pressed Brick Co., Ltd. ....	23
Brandon Pressed Brick & Tile Co. ....	23, 193
Brant co., gas in ....	245
analysis ....	252, 254
character ....	265
oil. <i>See</i> Onondaga oil-field.	
Brantford, oil at ....	245
Brantford Brick Co. ....	23
Brent, Charles ....	111
Breslau Brick Co. ....	108, 193
Brette, William ....	245
Brewer, J. W. ....	179
Brewster, T. J. ....	92, 96
Brick.	
Manufacturers of, list ....	27, 110
Production ....	3-5
<i>See also</i> Gowanlock Brick Co.	
Brigden, S. ....	74

	PAGE
Brigstocke, R. W. ....	122, 219
Brindley, J. ....	104
British America Nickel Corp. ....	42, 112
<i>See also</i> Murray nickel mine.	
Officers and work by ....	121
British American Oil Co. ....	34
British Columbia, diamonds in ....	47
Britnell, Wm. ....	183
Britnell & Co. ....	28, 183
Broadwell, Benjamin ....	23
Brockville Mg. Co. ....	34
Brodie, D. M. ....	68
Broggerite ....	43
Brougham tp. ....	178
Brouse, W. H. ....	145
Brown, A. H. ....	139, 159
Brown, E. A. ....	27
Brown, George ....	27
Brown, J. W. (Creighton mine) ....	76
Brown, J. W. (Vienna) ....	23
Brown, Oliver ....	191
Brown, Omar ....	185
Brown Bros. Brick Co. ....	23
Browning, L. J. ....	176
Brownscome & Sons, H. ....	23
Bruce, G. ....	104
Bruce, J. H. ....	98
Bruce Mines.	
Trap rock quarrying ....	112, 127
Buchanan, John Alexander ....	30
Buchanan Bros. & Co. ....	23
Buchowski, Mike ....	96
Buck, J. L. ....	23
Buck, J. R. ....	244
Buffalo Ontario Smelting & Refining Co. ....	176
Buffalo silver mine.	
Accident ....	76
Bullion from, photo ....	131
Concentrating plant ....	14, 129
Dividends ....	17
Mill, photo ....	131
Production ....	11, 12
Work at ....	132
Buffalo Union Furnace Co. ....	22, 171, 187
Building material.	
Quarrying of ....	189
Producers, list of ....	23-30
Production ....	3-5
Builing, S. ....	102
Bulki, A. ....	78
Bullion from Buffalo mine, photo ....	131
Bunting, George ....	179
Bunting, R. F. ....	179
Burgess, C. F. ....	23
Burgess, William ....	186
Burke lake ....	129
Burnside gold mine ....	9
Capital and date of charter ....	41
Work at ....	170
Burrell, G. A. ....	247, 251, 272
Burt tp. ....	170
Bushell, William ....	23
Butane in natural gas ....	251, 255
Butkovic, M. ....	98
Butwell Brick Co. ....	23
Byron, Wy., analysis of gas from ....	272
Cabana, Jr., Oliver ....	23

	PAGE		PAGE
Cady and McFarland .....	261-273	Canadian Oil Producing & Refining Co.	34
Cages, construction of .....	60	Canadian Pressed Brick Co. ....	193
Cairo Brick and Tile Works .....	23	Canadian Quarries, Ltd. ....	189
Calcite Lake Mining Co. ....	156	Canadian Rand Goldfields .....	41
Calcium carbide, production .....	3-5, 32	Canadian Salt Co. ....	32
Caldwell Bros. ....	173	Canadian Sulphur Ore Co. ....	31, 84, 174
Caledonia, Ont.		Canadian Tale & Silica Co. ....	33, 175
Gas .....	31	Canfield Natural Gas Co. ....	37
analysis .....	245, 254	Capink, O. ....	88
Gypsum .....	188	Capitano, F. ....	88
Calendoni, G. ....	78	Caps (explosive), regulations <i>re</i> ...	63
Caleta Silver Mines, Ltd. ....	19, 156	Card, N. B. ....	23
Calgary Brick & Supply Co. ....	41	Caribou Cobalt (Drummond) silver	
California, U.S., natural gas in ....	273	mine .....	129, 134
Callan, C. M. ....	184	Carlo, B. ....	88
Callan Bros., John .....	27, 28	Carlor, N. ....	74
Calomini, R. ....	100	Carnotite.	
Cameron, W. M. ....	27	Colorado .....	46
Cameron Island Syndicate .....	42	Notes on .....	44
Campbell, C. A. ....	48	Carpenter, G. ....	76
Campbell, Neil F. ....	23	Carpenter, Wm. ....	245
Campice, J. ....	82	Carson, Lieut.-Col. John .....	137, 164
Canada.		Cart lake, map .....	150
Silver production .....	14	Silver vein beneath .....	12
Canada Bolt & Nut Co. ....	187	<i>See also</i> Seneca-Superior s.m.	
Canada Brick & Fire Proofing Co. ....	23	McKinley-Darragh-Savage s.m.	
Canada Cement Co. ....	30	Carter and Kittermaster .....	32
Accident in plant .....	64, 108	Cartmell, William .....	28, 189
Work by .....	183, 189	Cartwright, Burr E. ....	153
Canada Chemical Co. ....	187	Cartwright, R. A. ....	153
Canada Crushed Stone Corp'n. ....	28, 108, 189	Case, W. G. ....	189
Canada Feldspar Corp'n. ....	41	Casement, R. R. ....	68
Canada Furnace Co. ....	22	Casey Cobalt silver mine .....	19
Accident at plant .....	93, 96	Concentrating plant .....	129
Canada Iron Corporation .....	22, 28, 193	Dividends .....	17
Accidents at plant ..64, 92, 93, 96, 104		Photo .....	133
Financial trouble .....	187	Production .....	11
Canada Iron Mines, Ltd. ....	22, 76, 171, 172	Work at .....	132
Canada Lime Co. ....	27, 184	Casey Majestic Mines, Ltd. ....	41
Canada Pebble Co. ....	30	Casey tp. ....	11
Canada Sand-lime Pressed Brick Co. ....	27	Cassidy, G. ....	100
Canada Screw Co. ....	187	Castanzo, M. ....	80
Canada Smelting & Refining Co. ....	14, 186	Castings of Ottawa, Ltd. ....	41
Canadian Concrete Products Co. ....	41	Castturat, Mi. ....	108
Canadian Copper Co.		Caswell, Edgar .....	24
Accidents at plants ..59, 74-82, 92, 96-108		Cavassino, P. ....	108
decrease of .....	54	Cayuga tps., gas in .....	245
Dill quartz quarry worked by ....	106	Cement plants, list of .....	30
Fuse troubles .....	67	production .....	3-5, 30
Hospital of .....	72, 117	Central Ontario Marble & Granite	
photo .....	116	Quarries .....	29
Officers of .....	113	Century Pressed Brick & Tile Co. ....	42
Pulmotor at plant of .....	70	Cesare, C. ....	104
Whitefish quartzite quarry worked		Chalmers, David .....	27, 189
by .....	224	Chambers-Ferland silver mine .....	11, 19
Work by .....	112-114	Accident .....	84
Canadian Copper & Armour Plate Co. ....	41	Officers .....	132
Canadian Exploration Co. ....	6, 10, 74, 84,	Royalties paid by .....	39
112, 122, 219		Work at .....	134
Canadian Explosives Co. ....	67	Champion Brick & Tile Co. ....	42
Canadian Furnace Co. ....	52, 187	Chapman, W. ....	84
Canadian Gas Co. ....	37	Charlotte, N.Y. ....	171
Canadian Gold & Silver Mg. Co. ....	19	Charlton lake, Sudbury dist. ....	224
Accidents at mine .....	59, 74, 84	Charlton & Englehart Power Co. ....	168
Canadian Homestake gold mine. ....	10, 110	Charon, O. ....	74
Canadian Marble Co. ....	29	Chauric, A. ....	88
Canadian Mineral Dev. Co. ....	41	Cheapside Gas & Oil Co. ....	37
Canadian Mining & Finance, Ltd. ....	157	Child's iron mine .....	172
Canadian Oil Companies .....	34	China, autunite in .....	44

	PAGE
Silver production .....	15
Chippewa Oil & Gas Co. ....	37
Chis, P. ....	88
Chorney, B. ....	82
Chowanski, S. ....	76
Christie, R. J. ....	184
Chrome iron ore, diamonds in .....	47
Chrysotile in Porcupine dist. ....	47
City of Cobalt silver mine .....	11, 19
Dividends .....	17
Work at .....	134
Clay.	
Don valley .....	185
Plants inspected, list of .....	186
working, list of .....	23-25
Clear lake, Capreol tp. ....	208, 231
Cleary Mines, Ltd. ....	41
Clemens, Moses .....	24
Cleriods, V. ....	80
Cleverger-Prophet Silver Mines, Ltd. ....	41
Clevite .....	43
Clifton Sand & Gravel Co. ....	30, 193
Accident in quarry .....	106, 108
Clinton formation.	
Gas-fields of Ontario.....	244, 245, 265
Cloche mts. ....	214, 221-225
Clover brand fuse .....	67
Cmejnteniz, Jas. ....	76
Coaston, D. ....	78
Coatby, Wm. ....	98
Cobalt.	
Bounties on .....	20
Market for .....	19
Percentage of, in Cobalt ores ....	15
Production .....	3-5
Cobalt Central silver mine .....	17
Cobalt Comet silver mine .....	11, 19
Capital and date of charter .....	41
Dividends .....	17
Drummond mine bought by .....	134
Cobalt district.	
Dividends .....	16, 17
Labour .....	73, 130
Mining Inspector's Report .....	129-154
Royalties from mines in .....	40
Silver production .....	10, 11, 129
Cobalt Frontenac silver mine.....	155
Cobalt lake.	
Drainage of, sanctioned .....	136
See also McKinley-Darragh-Savage mine.	
Cobalt Lake silver mine .....	19
Accidents .....	59, 61, 64, 68, 74, 84
Concentrating plant .....	129
Dividends .....	17
Mill, photo of .....	135
Officers .....	134
Production .....	11
Work at .....	134, 135
Cobalt Mines hospital, report of.....	72
Cobalt Provincial Mining Co. See Provincial Mining Co.	
Cobalt Reduction Co. ....	42, 129
Cobalt series .....	203
Cobalt Silver Queen. See Aladdin silver mine.	
Cobalt South Silver Mining Co. ....	41
Cobalt Townsite silver mine .....	19
Accidents .....	61, 64, 74, 84

	PAGE
Controlling City of Cobalt Mg. Co. ....	134
Dividends .....	17
Production .....	11, 18
Work at .....	136
Coboconk .....	184
Cochrane, G. C. ....	159
Cochrane silver mine .....	11, 19
Capital and date of charter.....	41
Cockshutt, S. ....	84
Coe Hill .....	171
Cohen, S. W. ....	137, 164
Colabianchi, G. ....	98
Cole, G. E. ....	219
Coleman, Dr. A. P. ....	200, 246
Acknowledgments to .....	201
Paper by, on Pre-Cambrian rocks	
N. of L. Huron .....	203-236
Coleman, J. A. ....	37
Coleman, W. ....	174
Coleman tp. See Cobalt dist.	
Collins (Asst. Inspector of Mines) ..	70
Collins, C. ....	114
Collins, C. C. ....	187
Collins, W. H. ....	233, 234
Colonial silver mine .....	11, 19
Accident at .....	64, 66, 84
Concentrating plant .....	129
Work at .....	136
Colorado, U.S.A.	
Carnotite in .....	44, 46
Silver production .....	14
Colquhoun, W. M. ....	112
Colterman, J. ....	74
Commonwealth Gold Mines, Ltd. ....	41
Commonwealth Oil & Gas Co. ....	37
Concentration of Cobalt ores.....	12, 13
Plants for .....	129
Condens, L. ....	82
Conglomerate.	
Aweres tp. ....	207
Doré river .....	231
Espanola, near .....	221
Heron bay .....	231
Hutton tp. ....	208, 231
Porcupine, photo .....	231
Ramsay lake .....	205
Timiskaming dist., auriferous veins	9
Trout lake, Bowell tp. ....	235
See also Sudbury series.	
Coniagas Reduction Co. ....	13, 20, 186
Accidents at plant .....	104
Capacity .....	129
Coniagas silver mine .....	19
Accidents .....	61, 64, 74, 84
Capital .....	130
Concentrating plant .....	129
Dividends .....	17
Fuse troubles .....	66
Labour troubles .....	130
Producing arsenic .....	31
Production .....	11
Work by .....	136
Works of, at Thorold .....	12
Conigle, P. ....	76
Coniston smelter .....	20, 112, 120, 121
Connecticut, U.S.A., autunite in ....	44
Connolly, Robt. ....	96
Connolly talc mine .....	176
Consol, J. ....	90

	PAGE
Consolidated Brick & Tile Co. ....	41
Constantini, D. ....	80
Construction material. <i>See</i> Building material.	
Conway, F. P. ....	24
Cook, J. S. ....	28
Cooper, James ....	137, 164
Cooper, W. H. ....	24, 193
Co-Operative Brick Co. ....	41
Copper production ....	3-6, 21
Copper Cliff.	
Arkose ....	211-214
Hospital ....	72
Water supply ....	113
Coracite, notes on ....	44
Cordova gold mine.	
Producing ....	6, 9, 10
Work at ....	173
Corkill, E. T. ....	54, 113
Corliss, C. V. ....	117, 121
Cornhill & Sons, James ....	24, 41
Cornwall co., Eng.	
Miners' phthisis ....	69, 70
Corundum production ....	3-5, 32
Coste, Eugene ....	241, 244
Cottrell, M. F. ....	156
Coughlin, Daniel ....	28
Coulson, Duncan ....	145
Cozoriz, P. ....	102
Craig pyrites mine ....	174
Cranston & Son, J. ....	24
Crawford, C. D. ....	76
Crawford Bros. ....	24, 193
Crean Hill nickel mine ....	20
Accidents ....	64, 74-82
Work at ....	113, 114
Credit Forks Brick & Tile Co. ....	24, 28, 41
Credit Valley Stone Co. ....	42
Creighton nickel mine.	
Accidents ....	64-68, 74-82
Hospital ....	113, 117
photo ....	116
Officers ....	113
Work at ....	113-116
plan of proposed ....	115
Creighton tp. ....	200
Creitzman, E. ....	78
Crellian, E. ....	104
Crews-McFarlan Mg. Co. ....	42
Cronin, D. E. ....	191
Crookston ....	184
Crookston Stone Co. ....	41
Cross & Wellington. ....	33, 59, 74, 174, 175
<i>See also</i> Henderson talc mine.	
Crow Lake Ironland Co. ....	42
Crowhurst, W. J. ....	24
Crowland tp., gas in ....	246, 254
Crown brand fuse ....	67
Crown Gypsum Co. ....	31, 188, 189
Crown Reserve Mining Co.	
Dividend ....	17
McEnaney claim worked by ....	164
Porcupine gold mine worked by ....	8
Crown Reserve silver mine ....	19
Accidents ....	84
Fuse troubles ....	67
Kerr lake drained by ....	137, 138
Officials ....	137
Production ....	11, 18

	PAGE
Royalties paid by ....	39
Crystal Lake Mines, Ltd. ....	41
Crystal Oil & Gas Co. ....	37
Crystalline limestone.	
Bastard tp. ....	185
French river, N. of, analysis ....	209
Wanup, near ....	208
Cuezina, H. ....	102
Culver, Frank L. ....	130
Cumberland, J. M. ....	24
Cuomo, M. ....	80
Curie, Madame ....	43
Currie silver mine ....	155
Curtis Bros. ....	24
Cutler, Alg. ....	226
Cyaniding.	
List of Cobalt mines employing. ....	129
Dane copper mine, accidents. ....	61, 64, 84
Dane lake, gold mining near ....	167
Daniels, F. I. ....	144
Dauskin, D. ....	37
Davenport, B. F. ....	24
Davidson, G. ....	100
Davies, Robert ....	186
Davis, L. ....	86
Davis & Son, John ....	24
Dawson, Iowa, natural gas ....	270
Dawson farm, E. Tilbury tp. ....	243
Day, James ....	155
De Meio, Guiseppo ....	76
De Zordo, A. ....	76
Deacon, R. W. ....	121
Dean Lake ....	227-229, 232
Dececkio, L. ....	78
Del Favero, Luigi ....	74
Delacco, D. ....	108
Deller & Sons, Geo. ....	24
Deller Bros. ....	24
Deloni, V. ....	102
Deloro.	
Reduction works at ....	12
Deloro Mining & Reduction Co. ....	13, 14,
20, 31, 179	
Accident at plant of ....	104
Delta, Ont. ....	185
Delta Lime Co. ....	27, 185
DeMartin, I. ....	82
Denison, Chas. L. ....	132
Deseronto blast furnace ....	182
Desert lake ....	177
Desoneau, E. ....	86
Devil lake ....	178
Devine, J. ....	84
Dexter, Kan.	
Natural gas at ....	269
Diabase, for roads ....	171
Diabase mt. ....	145
Diamond drilling.	
Government's revenue from ....	38
Michipicoten div. ....	113, 124
Porcupine dist ....	163
Sudbury dist ....	112, 121
<i>See also</i> Boring.	
Diamonds in chrome iron ore. ....	47
Dickenson, J. J. ....	246
Digasparo, A. ....	98
Dikes, M. ....	100
Dill quartz quarry, accident ....	106



	PAGE
Work at .....	116
Dill tp. ....	116
Diorite.	
Long Lake gold mine .....	218
Spanish river .....	221
Dishno, L. ....	74
Dividends.	
Cobalt mines .....16, 17, 132, 136,	141
Porcupine mines .....	17
Dmytre, J. ....	102
Docker, H. P. ....	245
Doddridge, West Virginia .....	261
Dodge, Geo. ....	24
Doherty, Askin tp. ....	234
Dolly Varden, Ont. ....	192
Dolomite in Essex and Kent gas-fields	241
Dolwowski, M. ....	78
Dolynick, M. ....	88
Dome gold mine .....	7, 8, 10
Accident .....	84
Hospital at .....	72
Mill, photo .....	158
Work at .....	158, 159
Dome Lake gold mine .....	10
Accident .....	84, 85
Mill, photo .....	159
Work at .....	159, 160
Domenic, L. ....	104
Domenick, S. ....	102
Domenico, B. ....	80
Domenico, E. ....	102, 96
Domenico, M. ....	102
Dominion Bank Building, Toronto.	
Gas in well at .....	246
Dominion Brick & Tile Co. ....	24, 41
Dominion Clay Products Co. ....	42
Dominion Feldspar, Ltd. ....	32
Dominion Improvement & Develop-	
ment Co. ....	32, 34
Dominion Mineral Exploration Co. ..	34
Dominion Natural Gas Co. ....	36
Dominion Nickel Copper Co. ....	74, 121
Dominion Reduction Co. ....	13, 41, 129,
	137, 141
<i>See also</i> Nova Scotia silver mine.	
Dominion Refineries, Ltd. ....	14, 31
Dominion Salt Co. ....	32
Dominion Sewer Co. ....	24
Dominion Wire Mfg. Co. ....	187
Don Valley Brick Works .....	24, 185
Donaldson, H. L. ....	154
Doney, George .....	82
Doolittle & Wilcox .....	189
Doré river .....	231
Dotynezuk, A. ....	86
Dowling, D. B. ....	232
Dowling silver claim .....	156
Downey, Larry <i>See</i> Downey silver	
mine.	
Downey silver mine .....	19, 155
Doyle, R. ....	86
Drain tile production .....	3-5
Drummond, J. ....	88
Drummond fraction .....	134, 138
Drummond silver mine .....	11, 19
Name changed to Caribou Cobalt..	129
Drury tp.	
Nickel mining. <i>See</i> Worthington	
mine.	

	PAGE
Dryden Timber & Power Co. ....	24
Dube, R. E. ....	74
Dublin Brick & Tile Works .....	24
DuBlois, W. H. ....	174
Dubois, J. ....	86
Duchess silver mine .....	153
Duck lake, N. of Schreiber .....	48
Duckett, J. H. ....	27
Dundas, O. ....	104
Dundonald tp. <i>See</i> Alexo s. m.	
Dungannon tp. ....	172, 182
Dunkovictaki, L. ....	78
Dunlap, D. A. ....	157, 159
Dunlop & Schmidt .....	24
Dunn, G. ....	90
Dunn Natural Gas Co. ....	37
Dunn tp., gas in .....	245, 254
Dunne, F. ....	86
DuPont, M. <i>See</i> Tonkin-Dupont.	
Durham, Ont.	
Cement plant at .....	30
Dutton oil-field production .....	34, 35
Dwyer, L. M. ....	184
Dykonicki, P. ....	100
Dylej, A. ....	74
Eacinti, G. ....	80
Earle, E. P. ....	145
East Dome Mines, Ltd. ....	19
Edward, B. ....	80
Edwards, A. R. ....	86
Edyvear, T. ....	100
Eganville .....	185
Eight-hour Act .....	73, 130
Elarton Salt Works Co. ....	32
Eldorado, Ont. ....	175
Electric smelter, notes on .....	179
Electric Steel & Metals Co. ....	42, 223
Elgin co.	
Gas in .....	35, 244
analysis .....	254
character .....	265
<i>See also</i> Bayham tp.	
Elizabeth gold mine .....	6, 10, 111
Elk Lake area, report on mining in..	154, 155
Elliott, Alfred S. ....	149
Elliott, William .....	24
Ellis, W. H.	
Paper by, on The analysis of Gases	247-254
Ello, J. ....	84
Elsie nickel mine .....	121, 216
Elspidia, P. ....	98
Ely, Kelly .....	98
Emard, Trefflé .....	24
Emillo, T. ....	98
Empire Limestone Co. ....	28, 30, 37, 190
Empire Marble Co. ....	41
Empire Oil Co. ....	34
Engera, V. ....	104
Ennis, R. J. ....	163
Ennis, S. C. ....	178
Ennis, W. E. ....	178
Enniskillen tp.	
Gas in .....	244
analysis .....	254
Oil in .....	36
Enrico, B. ....	100

	PAGE
Enrico, M. ....	100
Ensign-Bickford Mfg. Co. ....	67
Enterprise Gas Co. ....	37
Eralla, T. ....	78
Errington, R. ....	98
Espanola, Hallam tp. ....	221, 225, 233
Esquesing tp. ....	190-192
Essex co.	
Gas wells, abandoned ....	241
analysis . ....	241, 254
character . ....	265
Ethane in natural gas ....	251, 255, 266
Specific gravity . ....	266
Eudier, E. ....	74
Eugenio, C. ....	100
Eugenio, P. ....	102
Euphemia tp., gas in . ....	244
analysis . ....	254
Eureka Cement Pressed Brick Co. . .	41
Evans, H. W. ....	163
Evans, J. W. <i>See</i> Evans-Stansfield.	
Evans-Stansfield smelting process. .	179-181
Eve, Prof. A. S. ....	43
Evered, N. J. ....	163
Exeter Salt Works Co. ....	32
Explosives.	
Accidents from . ....	54-56, 63-65
Regulations <i>re</i> . ....	60-62
Fairbairn, G. ....	102
Fairbanks gas well . ....	36
Analysis . ....	254
Notes . ....	244
Farah, K. ....	24
Farak, J. ....	88
Farino, T. ....	80
Farr, C. C. ....	28
Fasken, Alex. ....	132, 153
Fasken, David . ....	145, 154
Federal Stone & Supply Co. ....	42
Fedyszyn, M. ....	88
Feldspar.	
Bedford tp. ....	171
Mining notes . ....	177
Producers . ....	32
Production . ....	3-5, 32
Fenningsdorf, F. ....	243
Ferguson, D. M. ....	139
Ferguson, W. N. ....	138
Ferland, Arthur. <i>See</i> Chambers-Ferland.	
Filion, S. O. ....	178
Fineout, Geo. H. ....	30
Finn, D. ....	100, 102
Finni, N. ....	86
Finucane, T. R. ....	144
Finucane, T. W. ....	144
Fire at Orillia refining plant. ....	14, 186
Firth & Son, T. F. ....	42
Fis, Joseph . ....	98
Fischle, G. C. ....	189
Fisher, Norman R. ....	153
Fisher-Eplett mine . ....	142
Flamborough tp., West . ....	189
Flanagan, D. D. ....	145
Flavelle Mining Co. ....	42
Fleming, J. H. ....	28, 190
Flemming vein, La Rose mine . ....	141
Fletcher, A. E. ....	173

	PAGE
Fletcher, Mr. ....	155
Fleur de Lis silver mine . ....	155
Flieler, E. & F. ....	27
Florica Mining & Milling Co. ....	42
Fluorspar.	
Madoc tp. ....	179
Statistics . ....	5
Flynn, C. B. ....	163
Foley Consolidated Brick & Tile Co.,	
The F. J. ....	24
Foley O'Brien silver mine . . .	64, 86, 160
Foote, William . ....	27
Forbes, D. L. H. ....	154
Forest City Mines Syn. ....	155
Forman, Stephen . ....	24
Formunch, V. ....	104
Forsyth, W. ....	108
Foster, C. A. ....	168
Fort William, brick companies at. .	110, 112
Fort William Brick & Tile Co. ....	110
Fortune, T. ....	82
Foster, E. ....	245
Foster, William . ....	27
Foster Cobalt Mining Co. ....	17
Foster Pottery Co. ....	24
Fountain falls, Montreal river. ....	129
Fox, G. J. ....	24
Fox farm, Gosfield tp. ....	241
France, autinite in . ....	44
Francesco, J. ....	102
Frank, C. D. ....	24
Fransel, F. ....	86
Franz, W. E. ....	124
Fraser, John . ....	30
Frazer & Logan . ....	24
Frederico, T. ....	104
Fredic, N. ....	86
Freeck, William . ....	24
Freeman, Albert . ....	163
Fretz, Jacob M. ....	28
Frid Brick Co., Geo. ....	24
Frid Bros. ....	24
Frontenac co., limestone and granite	171
Frontenac Floor & Wall Tile Co. . .	171
Frontenac lead mine . ....	176
Frood Mine, population of . ....	113
Frood nickel mine.	
Greywacké . ....	213
Production . ....	20
Frood Extension nickel mine.	
Accident . ....	60, 74
Photo . ....	118
Work at . ....	112, 117-119
Frost, Geo. H. ....	24
Fuller, Geo. ....	24
Fullerton, Geo. H. ....	176
Fuomi, A. ....	80
Fuse, regulations <i>re</i> . ....	63
Trouble from defective . ....	66
Gabbro, M. ....	74
Gabbro near Sudbury . ....	214
Gaiena, Nikola . ....	74
Galeta Silver Mines, Ltd. ....	41
Gallagher, Dan, A. ....	190
Gallagher Lime & Stone Co. ....	28, 190
Gamble, Robert . ....	157
Gamey, R. R. ....	111
Gamey-Thompson. <i>See</i> Thompson-Gowganda.	

	PAGE
Garalaki, J. ....	102
Gardiner, William .....	24
Garrepy, A. ....	76
Garson nickel mine .....	20
Accidents .....	58, 64, 66, 74, 88
Work at .....	117, 118
Gas. <i>See</i> Natural gas.	
Gas & Oil Co. of Springvale .....	37
Gas, artificial	
Variations in, notes on .....	256, 257
Gaspari, L. ....	88
Gasperoski, A. ....	82
Gassing, treatment of .....	71, 72
Gates, George .....	192
Gault, J. ....	102
Gauthier, G. H. ....	48, 49
Gauthier tp. ....	168
Gawant, S. ....	98
Gear, W. J. ....	137, 164
General Electric Co. ....	178
General Exploration Co. ....	41
Gentile, F. ....	86
Geology.	
L. Huron, North of, Paper by Cole- man .....	203-236
remarks on, by Miller .....	201, 202
Levack tp., paper by Brackenbury.	194-200
"Geology of Canada."	
Quotations from <i>re</i> Huronian .....	203
Georgian bay, Lake Huron.	
View of, from Cloche mts. ....	225
Georgian Bay Mining Co. ....	42
Germany, radium in .....	42
Natural gas in. <i>See</i> Neurengamme.	
Gertrude nickel mine .....	121
Norite in .....	200
Gethardt, E. A. ....	186
Gibson, Thomas W.	
Introductory letter by .....	ii
Statistical Review by .....	1-48
Gilchrist, J. J. ....	176
Gillespie Co., Geo. H. ....	33, 174, 175
Gillespie & Wellington .....	179
Gilmour gold mine .....	10
Gino, A. ....	74
Giovanni, B. ....	104, 108
Giovanni, C. ....	78, 102
Giovanni, G. ....	102
Giovanni, P. ....	96
Giovanni, S. ....	82
Giroux lake .....	137, 138
Glen Williams .....	191
Gletchineto, T. ....	102
Globe Refining Co. ....	33
Gloucester tp. ....	185
Godin, V. ....	80
Godson, T. S. ....	136
Golassi, A. ....	98
Gneiss.	
Ottawa valley .....	202
Sudbury dist. ....	208
Gold .....	9
Companies mining, list of .....	6, 10
India, imports .....	15
Kirkland Lake area .....	9, 168-170
Long lake, Sudbury dist. ....	6, 9, 10, 112, 219
Mine Centre, prospecting for....	110

	PAGE
Mining, Inspector's report....	110, 111, 122, 157-170, 173
Penage lake, near .....	220
Porcupine area .....	6-8, 157-166
Statistics .....	3-6
Whitefish river, L. Huron .....	224
Golden Fleece gold mine .....	173
Goldfields, Ltd. ....	6, 10, 167
Goldsworthy, R. ....	88
Gondman, J. ....	90
Gooderham, George H. ....	192
Gordon, B. R. ....	134
Gordon & Bruce .....	28
Gosfield tp., South.	
Gas in .....	241
Gosselin, C. ....	185
Gosselin Gold Mines, Ltd. ....	41
Gosti, V. ....	86
Gottaneo, T. ....	80
Goudreau pyrite mine .....	113, 124
Gould lake .....	34
Gould silver mine .....	11, 19, 138
Govenlock, J. M. ....	24
Gowanlock, J. ....	24
Gowanlock Brick Co. ....	110, 112
Gowdy, William .....	192
Gowganda lake.	
Waterpower near .....	129
Gowganda mining div.	
Inspector's report .....	156, 157
Recorder's report .....	48
Silver production .....	11
Grabowski, P. ....	74
Grabowski, V. ....	98
Grace iron mine .....	113
Graham, R. & E. ....	243
Grand Gypsum, Ltd. ....	41
Granite.	
Aweres tp. ....	207
Frontenac and Hastings counties..	171
Norway .....	43
Ottawa valley .....	202
Quarries, list of .....	28, 29
notes on .....	178, 179
Sudbury nickel reg. ....	206
Granite Crushed & Dimensions, Ltd.	28
Granite-gneiss.	
Levack tp. ....	194
petrography .....	199
Wanapitei, near .....	208
Granite station, Alg. North'n Ry..	226, 229
Grant, John .....	184
Graphite.	
Mines, names of .....	33
Production .....	3-5, 33
Grattan tp. ....	185
Gratts, E. ....	104
Gravel, list of concerns excavating..	193
Production .....	3-5
Gravel, Sand & Crushed Stone Co....	42
Gravenhurst Crushed Granite Co....	41
Gray, Young & Sparling Co. ....	32
Green, R. T. ....	145
Greenstone near Sudbury, photo....	215
Gregorcheff, E. ....	104
Grenville series.	
Description .....	236
L. Huron, N. of .....	203
notes by Coleman .....	208, 209

	PAGE
Gresanowski, S. ....	104
Greybull, Wyoming.	
Analysis of natural gas from ....	271
Greywacké.	
Auriferous veins in .....	9
L. Huron, N. of, Algoma Mills. .226,	227
Coche mts. ....	222
Long lake ....	217, 218
Porcupine, photo .....	230
Sudbury reg. ....	204, 214
McKim tp. ....	211
notes and photos .....	212, 213
Grian, I. ....	82
Gribben, W. ....	86
Grills, J. J. ....	139
Grodwards Co. ....	67
Grossatto, C. ....	100
Grubb, William A. ....	30
Guelph .....	192
Guelph formation, gas in, Essex co. .	241
Guhaien, S. ....	82
Guinta, J. ....	90
Guiseppi, Z. ....	100
Guiseppi, B. ....	104
Guiseppi, F. ....	74
Guiseppi, P. ....	96
Guiseppi, S. ....	78
Guiseppi, T. ....	104
Gull Lake gold mine .....	9
Capital and date of charter. ....	41
Gummite .....	44
Gutcher, P. ....	84
Gypsum.	
Caledonia, Ont. ....	188
Producers .....	31
Production .....	3-5, 31
Haapala, A. ....	88
Hagerman, Anson V. ....	30
Hagersville .....	191
Hagersville Contracting Co. .41, 108,	190
Hagersville Crushed Stone Co. ....41,	190
Hagersville Light & Fuel Co. ....	37
Haggarty, R. ....	76
Haines, R. B. ....	149
Haines, M. J. ....	149
Haldane, Dr. ....	69
Haldimand co.	
Gas in .....	245
analysis .....	252, 254
character .....	265
Gypsum in .....	31
Haldimand Development Co. ....	41
Haldimand Gypsum Co. ....	188
Hale, S. ....	124
Hall, David .....	245
Hall, Mrs. Henry .....	24
Hall, O. ....	117
Hallett, H. ....	24
Halliday, Jas. ....	243
Hallman, J. B. ....	24
Halmi, A. ....	82
Halton Brick Co., Ltd. ....	24, 193
Hambleton, Robert .....	190
Hambly, W. ....	114
Hamburg, Germany, analysis of gas	
near .....	272
Hamilton, Herbert .....	98

	PAGE
Hamilton, Ont.	
Limestone quarry owned by .....	28
Smelter at .....	187
Hamilton & Toronto Sewer Pipe Co. .	24
Hamilton Pressed Brick Co. ....	24
Hamilton Corundum Co. ....	41
Hamilton Molybdenum Alloys Co. .	41
Hamilton Steel & Iron Co. ....	187
Hamley, R. H. ....	24
Hammond, D. ....	88
Hancock, William .....	24
Haney, M. J. ....	183
Hanitenan, K. ....	78
Hanover Portland Cement Co. ....	30
Hansen, Hans Christian .....	30
Harbour Brick Co. ....	27
Hargrave silver mine .....	11, 19
Accident at .....	86
Royalties paid by .....	39
Work at .....	138, 139
Harja, J. ....	84
Harju, A. ....	80
Harrison & Beatty .....	28, 190
Harrison, West Virginia .....	261
Harvey, E. ....	27, 190
Hasselbring, A. ....	124
Hastings co., iron mining .....	21
trap rock .....	171
Hastings Quarries, Ltd. ....	28, 184
Hatch, H. B. ....	160
Havelock, Ont. ....	171, 184
Hawley, J. R. ....	76
Hawrylewicz, A. ....	82
Hay, Alex. M. ....	154
Health of miners .....	68, 69
Hebert, J. ....	27
Heclescher, August .....	145
Helen iron mine .....	22
Accidents at .....	66, 74, 76
Photo .....	126
Siderite .....	112
Work at .....	125
Helium in natural gas .....	253, 255
Hematite.	
Batchawana bay, N. of .....	207
Shebandowan lake .....	48
Hemmerick, G. ....	86
Henderson talc mine.	
Accident at .....	59, 74, 84
Photo .....	175
Work at .....	174
Hendra, Alfred .....	172
Heptane in natural gas .....	255
Hepworth-Silica-Pressed Brick Co. .	42
Heron bay, L. Superior, rocks. .205,	231
Hewitt, Arthur .....	256
Hewitt Lake Mining Syn. ....	156
Hexane in natural gas .....	255
Hibbert, E. E. ....	121, 122
Hicks, David .....	24
Higginson and Stevens .....	27
Hilka, V. ....	80
Hill, G. ....	78
Hill, V. ....	84
Hill & Sons, James S. ....	24
Hill Bros. ....	24
Hinde Bros. ....	24
Hiscock & Sons .....	24



	PAGE
Hitch, John .....	24
Hobson, R. ....	187
Hohl, Geo. ....	24
Holamas, L. ....	78, 80
Holden, J. B. ....	157
Holding, Charles .....	186
Holland, N. ....	178
Holland.	
Cobalt production .....	19
Hollinger gold mine .....	10
Accidents .....	61, 64, 66, 74, 86
Capital and date of charter.....	17
Dividends .....	6, 17
Fuse troubles .....	67
Mill capacity .....	157
Mining notes .....	7, 160
Officers .....	160
Production .....	6
Ventilation .....	70
Hollinger Reserve gold mine.	
Accidents .....	61, 64, 74
Mining notes .....	163
Holmes, J. A. ....	121
Holmes & Wilson. <i>See</i> British America Nickel Co.	
Holmes Gas Co. ....	37
Holton Bros. ....	24
Home Gas Co. ....	37
Homestake Mines Finance Co. ....	41
Hoover, A. E. ....	37
Hoover, D. E. ....	37
Hoover, J. E. ....	37
Horne, R. ....	86
Horton, J. A. ....	217
Hospitals .....	72
Hough, Chas. ....	96
Hough, J. A. ....	48, 49
Howard, C. D. ....	261
Howard tp., gas in .....	243, 267
analysis .....	254
Howery creek, Whitefish river.....	224
Howey, George .....	28
Howey, J. ....	84
Howlett, Fred. ....	24
Hryrts, R. ....	104
Hubert lake .....	155
Hudrga, J. ....	102
Hudson, G. ....	100
Hudson Bay silver mine, Cobalt.	
Accidents .....	61, 64, 74, 86
Concentrating plant .....	129
Dividends .....	17
Mining notes .....	139
Production .....	11
Royalties paid by .....	39
Hudson Bay silver mine, Gowganda.	
Accidents .....	60, 64, 86
Mining notes .....	139
Hughes, James .....	76
Hulkanen, O. ....	76
Humberstone, Thos. Allan .....	24
Humberstone Mutual Natural Gas & Fuel Co. ....	37
Humberstone tp.	
Gas in .....	244, 245
analysis .....	254
Limestone quarry .....	190
Hungary, natural gas in .....	271

	PAGE
Hungerford, H. B. ....	175
Hungerford tp.	
Iron pyrites mining .....	174
Limestone quarrying .....	184
Hunn, Joseph S. ....	144
Hunter, Magistrate .....	68
Hunter, S. ....	177
Huntington tp.	
Limestone quarry .....	184
Talc mine .....	174
Hunton Gold Mines, Ltd. ....	41
Huron Trap Rock Co. ....	112
Huronian.	
Description .....	236
L. Huron, N. of. <i>See</i> Coleman's Report on Pre-Cambrian rocks.	203-236
Hutchinson, F. L. ....	139
Hutton tp.	
Iron. <i>See</i> Moose Mountain iron m.	
Keewatin rocks .....	208, 231
Hydook, T. ....	104
Hydrocarbons in natural gas.....	251
Hydrogen sulphide in natural gas.	237, 240
Idaho, U.S.A., silver production ....	14
Ikaraloka, J. ....	102
Immigrants, character of .....	12
Imperial Cement Co. ....	30
Independent Natural Gas Co. ....	42
India, silver imports .....	14
Indian Specie Bank .....	15
Industrial Natural Gas Co. ....	37
Industries, notes on natural growth of	1
Ingersoll .....	192
Ingles, J. C. ....	190
Inland Steel Co. ....	60
Inspector of Mines. <i>See</i> Sutherland, T. F.	
Inter-Cities Quarries Co. ....	28
Accident .....	106, 108
Work by .....	111
International Hematite Co. ....	42
International Trap Rock Co. ....	112, 127, 128
Irish, Mark .....	192
Iron and Iron ore.	
<i>See also</i> Chrome iron ore, Hematite, Magnetite, etc.	
Aweres tp. ....	207
Batchawana bay .....	207
Companies mining .....	22
Eastern Ont., mining notes.....	171-173
Michipicoten div. ....	112
<i>See also</i> Helen m. and Magpie m.	
Moose mt. ....	123, 208
<i>See also</i> Moose Mountain iron m.	
Palmer tp. ....	207
Production .....	3-6, 21, 22
Iron pyrites.	
Foster tp., S. of .....	224
Goudreau iron mine .....	113
Helen iron mine .....	125, 127
Mining notes .....	174
Morrison mine .....	113
Northpines .....	110
Producers of .....	31
Production .....	3-5
Irving, Prof. Ronald D. ....	229
Irwin, W. J. ....	24

	PAGE		PAGE
Jackman, H. E.	154	Moose mt., photo	207
Jackson, H.	104	Kelley lake	214
Jaffray tp., Gold mining in. <i>See</i> Canadian Homestake mine.		Kelso, Alex.	167
Jairainen, Victor	76	Kenabutch, Lewis tp.	226
James, C. C.	130	Kendeyewiz, W.	82
James, J. B.	84	Kennedy, R. C.	29, 192
James, R. H.	149	Kenora.	
James, Wm.	24	Gold mining near. <i>See</i> Canadian Homestake g. m.	
Jamieson, J. A.	24	Kenora Mining division.	
Jamieson Lime Co.	28	Recorder's report	48
Janes, H.	25	Sales and leases	39
Janes, W.	88	Kent, W.	113
Janick, W.	102	Kent Bros.	34, 177, 178
Jarvinuik, L.	82	Kent gas-field	35, 36
Jarvis Oil & Gas Co.	41	Analyses of gas	252, 254
Jasansky, J.	98	list of wells sampled	243
Jasensky, L.	98	Character of gas	265
Jasper.		Hydrogen sulphide in	240
Batchawana bay, N. of	208	Map	242
Jeffery, W.	82	Notes	241
Jelly, J. M.	28	Price of gas	267
Jenkins, Charles	32	Kermode, W.	86
Jenkinson, G.	246	Kerr, Fred.	25
Jervis & Son, John	25	Kerr lake.	
Joachimstal, Bohemia	44	Draining of	129, 137, 138
Joel (Marion) lake, Wisner tp.	200	photo	140
John Mann Brick Co.	27	Silver vein in, photo. Facing...	i
Johnson, A.	74	<i>See also</i> Drummond fraction.	
Johnson, Charles	61, 84	Kerr Lake Mining Co.	
Johnson, Elmer	78	Kerr lake drained by	137
Johnson, I.	86	Kerr Lake silver mine	19
Johnson, James	25	Accident	86
Johnson, P. B.	76	Capital	139
Johnston, E.	100	Dividends	17
Johnston, Joseph	25	Officers	141
Johnston, R. A. A.	47	Production	11, 18
Jones, E. W.	132	Property drained	12
Jones, George	108	Work at	141
Jones, John	112	Kerr-Addison Mines, Ltd.	41
Jones, P.	104	Kerry Mining Co.	153
Jones, Tom R.	132	Keweenaw formation.	
Jordan, F. A.		Description	236
Jordan, J. J.	84	L. Huron, N. of	203, 206, 235
Jordon, Daniel	25	Mamainse pt.	235
Jorgensen, Capt. Conrad	130, 132	Kidd, Rev. Father	246
Joseph, M.	80	Killarney, Rutherford tp.	
Josephine iron mine	113, 124	Quartzite quarry	223, 224
Julio, O.	90	Rocks at and near	203, 222, 223
Jupiter gold mine	10	Killarney bay, L. Huron	223
Kaar, John	25	Kindy, D. & Sons	37
Kaartinen, E.	88	Kindy Gas Co.	37
Kalader tp.	173	King, E.	84
Kanio, V.	82	King, Joseph	245
Kantamaki, Emil	78, 82	King Edward silver mine	129, 154
Karpinski, F.	78	King st., Toronto	246
Kansas, U.S.		Kingsdale Brick Co.	42
Natural gas in	261-263	Kingston, limestone quarries	185
analysis	270	Kingston Feldspar & Mining Co.	
Karulenski, P.	86		32, 34, 177
Kasparak, J.	76	Kingston Floor & Wall Tile Co.	171
Kearuz, J.	104	Kingston penitentiary, quarry owned by	28, 29
Keeley silver mine	19	Kingston Sand & Gravel Co.	30, 193
Keewatin formation.		Kirby, T. Sidney, Co.	29
Description	236	Kirkegaard, P.	173
L. Huron, N. of	203	Kirkland and Swastika Lakes area.	
age	206	Mines producing	6
notes	206-208		

	PAGE
Mining in, notes on .....	9, 168
Kirkland lake.	
Gold mining on. <i>See</i> Wright-Hargraves m.	
Kirkland Lake Development Co. ....	41
Kirkland Lake Gold Mines, Ltd. ....	41
Kirkland Lake Proprietary, Ltd. ....	9, 168, 170
Kirkwood nickel mine .....	120
Kiss-armas, Hungary.	
Natural gas, notes and analysis...	271
Kitchen, A. ....	84
Kivimaki, E. ....	80
Klemp, F. ....	102
Knaapi, J. ....	74
Knight, Cyril W. ....	202, 203, 208, 230
Knox, Henry ....	98
Koebel, Joseph Z. ....	25
Kohinoor Gold Mines, Ltd. ....	42
Kohler & Aikens ....	37
Kolic, Frank ....	98
Koloski, F. ....	88
Koniadina, J. ....	74
Korah, Peter ....	104
Korclitz, F. ....	80
Koreski, C. ....	82
Koreski, J. ....	100
Korpi, N. ....	78
Koski, P. ....	80
Kostynyk, T. ....	82
Kotch, A. ....	104
Kramer, H. L. ....	163
Krazy, Mike ....	78
Kreuznach, Saxony. ....	45
Kruger, R. ....	82
Kruse Bros. ....	25
Krustook, P. ....	86
Krynarić, F. ....	84
Kryzowsky, N. ....	104
Kuhn, Henry J. ....	25
Kurnicki, N. ....	86
Kyanite schists.	
Sudbury dist., S.E. portion.....	209-211
La Mine D'Or Huronia .....	6, 10
Capital and date of charter .....	41
Work by .....	168
La Rose silver mine .....	19
Accident .....	86
Dividends .....	17, 141
Officers .....	141
Production .....	11, 18, 141
Work .....	142
La Rose Extension silver mine .....	144
Labour, character of mining .....	1
notes .....	73
Cobalt dist. ....	130
Lacey mica mine .....	34, 177
Laidlaw, E. C. R. ....	149
Laiho, V. ....	74
Lake Erie.	
Gas in, analysis .....	245, 254
north of, paper by Mickle..	237-254
Lake Huron.	
Pre-Cambrian rocks N. of, paper by Coleman .....	203-236
Lake Superior conglomerate .....	231
Lake Superior Power Co. ....	113, 121

	PAGE
Lakefield .....	30
Lalor, F. R. ....	37
Lalor, Aikens & Smith .....	37
L'Amable .....	171
Lamb, Alfred .....	37
Lamb, R. W. ....	37
Lamb, W. B. ....	37
Lambe, R. B. ....	149
Lambton co.	
Gas in .....	36
analysis .....	252, 254
character .....	265
notes on wells .....	244
Oil in .....	36
production .....	34, 35
Lampi, D. ....	104
Lang Bros. ....	25
Langman, J. ....	28
Langmuir tp. ....	163
Lansdowne channel, L. Huron .....	223
Larder Lake area.	
Mining notes .....	167
Producing mines .....	6
Recorder's report .....	48
Larrilla, L. ....	80
Latasky, T. ....	98
Launders, Thos. ....	25
Laurie, N. ....	100
Lavallee, Louis .....	96
Laurentian.	
North of L. Huron. <i>See</i> Coleman's	
Paper on Pre-Cambrian rocks.	
Levack tp. ....	194
petrography .....	199
Laurentide Mica Co. ....	178
Lavoie, Alfred .....	28
Lawler, Ed. ....	98
Lawson, Andrew C. ....	232
Lawson, John .....	113
Lawson silver minae. <i>See also</i> La	
Rose s. m.	
Production .....	141
Work at .....	142
Lawson tp. ....	156
Lazovowitz, W. ....	74
Lead acetate. <i>See</i> Acetate of lead.	
Lead statistics .....	4-6
mining .....	176
Leamington Brick & Tile Co., Ltd. ....	25
Leamington oil-field production....	35
Leatherdale, R. W. ....	25
Lebel tp. ....	139
Leckie & Collis .....	67
Leconte, Dr. J. L. ....	44
Ledyard iron mine. <i>See</i> Belmont iron	
mine.	
Lee, D. W. ....	243
Lefebvre, A. ....	74
Lehay gold claim, S. of Foster tp. ....	224
Lehigh plant, Point Anne .....	183
Leith, Prof. C. K. ....	229
Lenio, D. ....	104
Leonard, R. W. ....	136
Leskinen, A. ....	80
Leslie, Alfred .....	28
Lethbridge, W. W. ....	25
Levack tp.	
Geological section .....	194

	PAGE		PAGE
Nickel in, prospecting for . . .	112, 117	Luigi, B. . . . .	102
Rocks in, paper by Brackenbury	194-201	Luigi, C. . . . .	100
Lewis, H. . . . .	90	Luigi, F. . . . .	82, 100
Lewisohn, Julius A. . . . .	157	Luigi, J. . . . .	104
Licenses. <i>See</i> Mining licenses.		Luigi, P. . . . .	100
Lichty, J. B. . . . .	25	Luigi, Z. . . . .	102
Lichvazuk, P. . . . .	74	Lukin, Y. . . . .	82
Light, W. (Can. Copper Co.) . . . .	100	Lumsden, G. D. . . . .	28
Light, William (Aylmer) . . . . .	25	Lumsden, John . . . . .	144
Lime.		Lumsden silver mine . . . . .	11, 19, 144
Producers . . . . .	28	Luni, G. . . . .	98
Production . . . . .	3-5	Luoma, M. . . . .	82
Lime kilns . . . . .	184, 185, 189-193	Luomo, J. . . . .	80
Limehouse . . . . .	192	Lyman, R. H. . . . .	153
Limestone.		Lythmore . . . . .	188
Frontenac and Hastings counties..	171	Maampaa, J. . . . .	76
Quarries, list of . . . . .	28, 29	McAllister, J. C. . . . .	121
work at . . . . .	183-185	McAndrews, Thomas . . . . .	74
Sudbury dist. . . . .	209	McAuley, Dr. . . . .	117
Penage lake, analysis . . . . .	220	McCamus, T. . . . .	139
<i>See also</i> Trenton formation, etc.		McCormick Bros. . . . .	25
Lincoln Clay Products, Ltd. . . . .	41	McCracken Corp., Ltd. . . . .	25
Lind, J. G. . . . .	192	McCredie, W. . . . .	25
Lindella, James . . . . .	78	McDonald, Duncan . . . . .	76
Lindsay, Stephen . . . . .	25	Macdonald, William . . . . .	245
Lines, J. C. . . . .	25	McDonald & Reasbeck . . . . .	25
Lingham, W. T. . . . .	25	McDonald Feldspar Co. . . . .	32
Linn, W. . . . .	76	McDougall, D. . . . .	90
Lint, S. . . . .	82	McEnaney gold mine . . . . .	164
Lint & Emerson . . . . .	37	McGibbon, D. Lorne . . . . .	141
Lippinen, Mat. . . . .	82	McGibbon, Dugald . . . . .	25
Liquefaction, analysis of gas by . .	251	McGoff, J. . . . .	74
<i>Lit par lit</i> structure . . . . .	214	McGrath, Pat . . . . .	108
Little, Mark . . . . .	138	McGregor, J. . . . .	74, 84, 88
Little Mullet lake . . . . .	172	McGuinness, W. . . . .	74
Liugraine, G. . . . .	100	McGuire, J. . . . .	88
Livcola, F. . . . .	108	McInnis, D. . . . .	90
Livermore, Robert . . . . .	141, 157	McIntyre-Porcupine gold mine.	
Lockhart, Henry . . . . .	157	Flow-sheet, diagram . . . . .	161
Logan, Hugh . . . . .	191	Mill completed . . . . .	157
Logan, John . . . . .	25, 186	Officers . . . . .	163
Logan, Sir William E.		Photo . . . . .	162
Views of, <i>re</i> Laurentian . . . . .	202, 203	Work at . . . . .	163
Loganian series . . . . .	203	Mackay, A. A. . . . .	113, 127
Logue, J. . . . .	104	McKay, Geo. A. . . . .	167
Long lake, S. of Waters tp.		MacKay Bros. . . . .	25
Description . . . . .	9, 217	Mackay mt.	
Gold mining . . . . .	6, 10, 112	Brick making. <i>See</i> Gowanlock	
<i>See also</i> next item.		Brick Co.	
Long Lake gold mine, S. of Waters tp.		McKee, A. G. . . . .	187
Notes . . . . .	219	McKelvie, A. A. . . . .	139
Photo . . . . .	218	McKenzie, G. . . . .	104
Rocks . . . . .	214, 215	McKim tp.	
Longford Mills . . . . .	191, 193	Greywacké . . . . .	211-214
Longford Quarry Co. . . . .	29, 191	Nickel mining. <i>See</i> Frood Extension.	
Longo, M. . . . .	98	McKinley-Darragh-Savage silver mine.	
Longwell, Alex. . . . .	136, 174, 184	Accident . . . . .	86
Lormy, J. . . . .	78	Concentrating plant . . . . .	129
Lorrain formation in Scarborough tp.	246	Dividends . . . . .	17
Loughborough Mining Co. . . . .	34, 177	Fuse troubles . . . . .	67
Loughborough tp. . . . .	34, 176	Mill, photo . . . . .	143
Lowe, Gordon . . . . .	25	Officers . . . . .	144
Lowery, Charles . . . . .	191	Production . . . . .	11, 18, 145
Lucky Cross gold mine . . . . .	6, 10	Work at . . . . .	144, 145
Closed . . . . .	168	MacKinnon, Ed. . . . .	78
Mill, photo . . . . .	167	MacLaren, G. R. . . . .	127
Lucky Godfrey silver mine . . . . .	155	MacLaren, W. L. . . . .	34
Ludivina, F. . . . .	100		



	PAGE
McLaughlin, W. J. ....	172
McLean Bros. ....	25
McLeod, D. ....	84
McLeod, S. ....	245
McLoughlin John ....	25
McMartin, J. ....	157
McMillan, A. D. ....	156
McMillan, E. V. ....	173
McMillan, Fred. ....	28
McMillan, Hugh ....	167
McNair, D. ....	74
McNamara, F. ....	86
McNamara, T. ....	116
McNaughton, George W. ....	177
McNeill, Dr. ....	72
McNeill, W. K. ....	47
Report by, on Assay Office ....	49-51
Work by, on analyses ....	209, 217, 220
McPhail & Wright Construction Co. ....	33
McQuire, H. F. ....	48, 49
McRae, Donald ....	156
MacRow, Henry ....	185
MacTernan, J. ....	28
McVichie, J. A. ....	130, 132
McVittie tp. ....	168
McWilliam, J. ....	33
McWilliams, R. H. ....	191
Madagascar, autunite in ....	44
Madawaska river, waterpower from. ....	178
Madoc. ....	
Fluorspar mining near ....	179
Talc mining near ....	174-176
Madoc Mining Co. ....	113, 124
Madoc tp., uran-ochre in ....	44
Magmatic segregation in Levack tp. ....	201
Magnetite in Aweres tp. ....	207
Magpie iron mine ....	112
Roasting plant, photos ....	124, 125
Work at ....	124, 125
Magpie river. ....	
Waterpower on. <i>See</i> Steephill falls. ....	
Maisonville tp. ....	49
Majdam, W. ....	88
Maki, A. ....	80
Maki, J. ....	74, 76
Maki, W. ....	78
Maki, Yan ....	82
Makki, Z. ....	102
Malinere, Otto ....	76
Maloney, John ....	25, 29
Malynk, O. ....	74
Mamainse, coracite at ....	44
Mamainse pt. ....	235
Mammoth iron mine ....	207
Manitou lake ....	232
Mann silver mine ....	11, 19
Accident ....	86
Mining notes ....	156
Manufacturers' Corundum Co. ....	32
Manufacturers' Natural Gas Co. ....	37
Maps. ....	
Cart and Peterson lakes ....	150, 151
Kansas, showing gas wells ....	262
Kent gas-field ....	242
Ontario, part of. ....	<i>Facing</i>
Pennsylvania, showing gas wells. ....	259
West Virginia, showing gas wells ....	260
Mapes-Johnston silver mine ....	155

	PAGE
Maple Leaf Portland Cement Co. ....	30
Maple Sand, Gravel & Brick Co. ....	41
Marble quarries ....	29, 182
Marchand, J. ....	184
Marchi, D. ....	104
Marcovitch, J. ....	86
Marion, West Virginia ....	261
Markets for silver ....	14, 15
Markus & Co. ....	29
Marlbank, cement plant near. ....	30
Marren, J. ....	28
Marron, B. ....	187
Marshall, J. ....	28, 29, 37, 191
Marshall, W. W. ....	25
Marsino, G. ....	98
Marten Lake Mining Co. ....	41
Martin, David ....	25
Martin, Edward ....	37
Martin, J. ....	102
Martin International Trap Rock Co. ....	
<i>See</i> International Trap Rock Co. ....	
Martindale gypsum mine ....	189
Masalin, P. ....	78
Maski, C. ....	80
Maslyk, J. ....	98
Mason, Charles ....	25
Massachusetts, U.S.A., autunite in. ....	44
Massey copper mine ....	225
Masten, C. A. ....	144
Matheson, W. ....	76
Mathieson, W. ....	84
Matson, A. ....	88
Matthews, Sergeant ....	70, 71
Mattson, George ....	76
Mawhinney, Robt. ....	25
Mayer & Ross ....	37
Maynooth ....	179
Mayo tp. ....	172
Mazowick, M. ....	78
Meaford Brick Co. ....	25
Meat Bird lake ....	113
Medina formation. ....	
Haldimand co. ....	245, 265
Norfolk co. ....	244, 245
Welland co. ....	265
Medina Natural Gas Co. ....	37
Meek, H. C. ....	158
Mein, W. W. ....	158
Melville, W. ....	86
Mercur, R. J. ....	182
Merkley Bros. ....	25
Metal Refining Act ....	20
Metallurgical works, accidents in. ....	
53, 54, 58, 92-105 ....	
<i>See also</i> Blast furnaces, Smelters. ....	
Metals Chemical Co. ....	14, 31
Meteor Silver Mining Co. ....	145
Methane in natural gas ....	251, 257, 266
Metro, C. ....	100
Mexico, silver production ....	14
Meyer & Charlton gold mine, Rand field ....	69
Meyers, H. ....	104
Mica. ....	
Mines, names of. ....	34
Mining notes ....	177
Production ....	3

	PAGE		PAGE
Mica schist.		Monell, Ambrose	158
N. of L. Huron	225	Monmouth tp.	179
Michigan Central limestone quarry..	191	Monongalia, West Virginia	261
Michipicoten.		Monserat, S.	80
Sedimentary rocks near.....	205	Montgomery, G.	74
Michipicoten div.		Montgomery, John	28
Iron mining in	21, 112	Montoux Bros.	25
Mickle, G. R.		Montreal river, waterpower on.....	129
Notes by, on:—		Montreal River Mining div.	
Mining Tax Act	40	Recorder's report on	48
Natural Gas Industry	35, 36	Montreal Rolling Mills Co.	187
Paper by, on:—		Montreal street, Kingston	185
Composition of Natural Gas..	237-273	Monyez, Wrye	78
Mickle tp.	155	Moody, G. W.	25
Micropegmatite in Levack tp....	194, 198	Moore, Dr.	72
Midfield Natural Gas Co.	37	Moore, E. S.	231
Midland, Ont.	187	Moore, James	28
Mikado Consolidated Gold Mines, Ltd.	42	Moorhead, R. D.	138
Milan, Stephen	74	Moose Horn silver mine	155
Miles, A. D.	113	Moose mountain, Hutton tp.	
Miller, G.	100	Iron formation, photo of	207
Miller, George C.	132	Rocks	208
Miller, Prof. W. G.	47	Moose Mountain iron mine.	
Age of Grenville series given by..	208	Notes	123
Notes by, on Coleman's Paper on		Photos	123, 206
Pre-Cambrian rocks	202, 203	Moose Mountain, Ltd.	112
Miller lake	157	Morash, H.	86
Miller Lake-O'Brien silver mine.		Morelli, A.	102
Concentrating plant	129	Morgan, Fred.	193
Waterpower for	129	Morgan, J. W.	48
Work at	156	Morley, Walker	25
Millerett silver mine	156	Morley & Ashbridge	25
Milliken, John F.	149	Morrison, G. F.	134, 149
Mills, Geo. E.	25, 193	Morrison, Thomas	183
Milton, Peter	28	Morrison iron mine	113, 124
Milton Pressed Brick & Sewer Pipe		Morse Porcupine Mines, Ltd.	41
Co.	25, 193	Moses, M.	86
Mine Centre.		Mouldrey, John	25
Gold prospecting near	110	Mount McKay Products, Ltd.	41
Rocks at	205, 232	Mountain Lake Silver Mines, Ltd.	41
Mine hospitals	72	Moyrihan, E. J.	69
Miner, J. T.	25	Muldoon, J., & Co.	28
Mineral production	2-6	Müller, Herman	45
Miners' licenses	38, 39	Mullinex, W. C.	25
Miners' phthisis	68	Mumford, Mr.	117
Mines, ventilation of	70, 71	Mumi, John	82
Mines Leasing & Develop'nt Co.	6, 10, 165	Munro, D. W.	25
Mining Inspector's report.....	110-193	Munro tp.	49
Mining Act. See Acts of Parliament.		Munsell, Eugene, & Co.	178
Mining accidents. See Accidents.		Murdock gold claim, S. of Foster tp..	224
Mining companies, list of new ..	40	Murphy, Dennis	145
Mining lands statistics.....	39-42	Murphy, J. A.	188
Mining regulations, observance of...	58	Murphy, J. S.	29
Mining revenue	38, 39	Murray, Alexander	205
Mining Tax Act	39, 40	Murray, J. A.	134
Minta, F.	102	Murray, Timothy	25
Miracle gold mine	163	Murray nickel mine.	
Mispickel	224	Accident	86
Mississagi river, L. Huron..	203, 227, 228	Sudburite near, analysis	216, 217
Modiste, J.	78	Work at	112, 121
Moffat-Irving Steel Works, Ltd.	41	Muscatello, R.	76
Mohl, S.	80	Musmici, S.	74
Moitemise, A.	76	Mussens, Ltd.	67
Mond Nickel Co.	20, 21, 33	Muurling, I. J. R.	163
Accident at plant	104		
Boring by, Levack tp.	112, 117	Nachoff, C.	76
Officers	117	Naczuk, G.	82
Work by	117, 120	Naibeff, D.	108

	PAGE
Nanticoke Natural Gas Co. ....	37
Napanee Brick & Tile Co. ....	25, 41
Narraway, Charles .....	173
National Fire Proofing Co. ....	25
National Gas Co. ....	37, 41
National Portland Cement Co. ....	30
Natural gas.	
Analyses of various .....	254
Chemical composition of, paper by Mickle .....	237-273
Industry, notes on .....	35, 36
Pennsylvania, analysis and wells..	259
Price .....	267
Producers, list of.....	37, 38
Production .....	3, 35
Sampling of, for analyses .....	237, 238, 247-253
Tax on, revenue from .....	40
Viscosity of .....	266
Water in, effect of .....	267
Wells, regulations concerning ....	36
Naughton, Ont.	
Greywacké .....	213
Nayler & Son, J. W. ....	25
Near lake .....	243
Neeland tp. ....	120
Neelands, E. V. ....	134, 138
Neil, J. ....	84
Neilly, B. ....	149
Nelson, Robert .....	190
Netropka, N. ....	82
Neuengamme, near Hamburg, Ger- many.	
Analysis of natural gas near.....	272
Nevada, U.S.A., silver production..	14
New, Edward .....	25, 30, 193
New Caledonia, chrome iron ore....	47
New Ontario Pressed Brick Co. ....	41
New York & Ontario Mica Co. ....	34
New York Graphite Co. ....	179
Newell, J. ....	104
Niagara Brick & Tile Co. ....	41
Niagara National Gas & Fuel Co. . .	37
Niagara tp. ....	191
Nichols, J. C. ....	113
Nichols Chemical Co. ....	174
Nicholson, James .....	98
Nick, H. ....	46
Nickel.	
Bounties on .....	20
Cobalt ores, percentage of .....	15
Duck lake .....	48
Dundonald tp. <i>See</i> Alexo mine.	
Production .....	3-6, 20
Schreiber, prospecting for .....	110
Sudbury dist., mining notes .....	112-122
Nickelton .....	112, 121
Nickerson, William C. ....	141
Nicol tp. ....	156
Niemi, E. ....	68, 80
Nighthawk lake .....	163
Nigus, D. ....	98
Nikola, T. ....	108
Nipigon lake.	
Conglomerate .....	231
Sedimentary rocks .....	205
Nipissing Mines Co., officers.....	145
Nipissing Mining div.	

	PAGE
Sales and leases .....	39
Nipissing Reduction Co. ....	129, 130, 132
Nipissing silver mine.	
Concentrating plant .....	129
Mill, photo .....	146
Mining notes .....	147, 148
Nitrogen in natural gas..	255-257, 261-264
No. 2 and No. 3 mines. <i>See</i> Creighton mine.	
Noble, J. J. ....	34
Nolan, J. ....	74
Norfolk co.	
Gas in, analysis .....	245, 254
character .....	265
Norfolk Gas Co. ....	38
Norite in Levack tp. ..	194, 196, 197, 201
Norme, W. ....	74
North American Smelting Co..	68, 104, 176
<i>See also</i> Perth Road lead m.	
North Burgess tp. ....	34
North Carolina, autunite in .....	44
North Dome gold mine.	
Accidents .....	64, 74
Closed .....	163
North Shore Gas Co. ....	38
North Thompson gold mine .....	163
North Star Cobalt Mines, Ltd. ....	41
North Star nickel mine .....	20
Accident at .....	64, 88
Work at .....	119, 120
Northern Building Material & Iron Co. ....	41
Northern Customs Concentrators	136, 148
Northern Customs mine .....	88
Concentrating plant .....	129
Northern Ontario Light & Power Co.	129
Northern Pyrites mine.....	88, 110
Northpines.	
Iron pyrites mining at .....	110
Northwestern Gas Co. ....	38
Norton, Alsey .....	25
Norton, David .....	25
Norton, T. W. ....	25
Norway, uraniobate in .....	43
Nova Scotia silver mine .....	86
Novark, N. ....	84
Nozzoren, L. ....	104
Oakville Pressed Brick Co. ....	25
Oates, Jos. ....	108
O'Brien, M. J. <i>See</i> Miller-Lake- O'Brien and O'Brien silver m.	
O'Brien silver mine .....	19
Accident .....	88
Concentrating plant .....	129
Mining notes .....	148, 149
Production .....	11
Reduction works at Deloro .....	12, 14
Royalties paid by .....	39
Obumsaioin, O. ....	76
O'Connell, C. A. ....	169, 170
O'Connor, D. ....	47
O'Connor, Richard .....	174
O'Connor tp. ....	111
Offer, W. C. ....	10
Ogden tp. ....	163
Oil. <i>See</i> Petroleum.	
Oil Springs, Ont. ....	244

	PAGE
Oil Springs Co.	
Analysis of gas .....	254
Boring by, for gas .....	244
Ojaipac Co. ....	32
Ojreck, T. ....	88
Oksalo, J. ....	100
Old, James .....	188
Olivene-diabase in, Levack tp. ....	194, 200
Oliver, D. G. ....	155
Oliver & Webster .....	29, 191
Ollmann Bros. ....	25, 30, 193
Accident at quarry of .....	106, 108
Olson, K. E. ....	82
Olympia gold mine .....	10
Onaman iron range .....	231
Oneida Lime Co. ....	28
Oneida tp. ....	189
Onondaga formation.	
Kent gas-field .....	241
Onondaga Oil & Gas Co. ....	38
Onondaga oil-field, production. ....	34, 35
Onondaga tp.	
Oil in .....	245
analysis .....	254
Ontario.	
Diamonds .....	47, 48
Mineral statistics .....	3-6
Mines, report on .....	110-193
Mining labour .....	1, 2
Natural gas, composition of .....	237-273
Ontario Granite Crushed Stone Co. ....	41
Ontario Graphite Co. ....	178
Ontario Limestone & Clay Co. ....	28
Ontario Marble Quarries, Ltd. ....	29, 182
Ontario National Brick Co. ....	25, 42
Ontario Paving Brick Co. ....	25
Ontario Peoples' Salt & Soda Co. ....	32
Ontario Portland Cement Co. ....	30
Ontario Power Co. ....	189
Ontario Rock Co. ....	29, 108, 171, 184
Ontario Sewer Pipe Co. ....	25
Ontario Steel Products Co. ....	41
Ontario Stone Corporation .....	42
Orangeville, cement plant at .....	30
Oraskovitsk, N. ....	86
Orde, M. H. ....	175
Ore Chimney Mining Co. ....	173
Ore Extension Mining Co. ....	42
O'Reilly, T. E. ....	25
Orillia.	
Refining plant at, burned .....	14
rebuilt .....	186
Orion Realty silver mine. ....	11
Orr Gold Mines, Ltd. ....	41
Orton iron mine .....	173
Osborne, T. ....	88
Oskrowske, M. ....	100, 102
Otrotoni, G. ....	104
Ott Brick & Tile Co., Ltd. ....	25
Ottawa, mica-trimming works at .....	178
Limestone quarry near .....	185
Ottawa Brick Mfg. Co. ....	26
Ottawa river.	
Granites and gneisses .....	202
Owen, J. ....	112
Owen Sound .....	189, 190, 191
Owen Sound Brick Co. ....	26, 193
Oxford Oil Gas Co. ....	38

	PAGE
Paanamen, M. ....	78
Painter, R. K. ....	110
Paisley & Chisholm .....	26
Pakowkami lake, Gladstone tp. ....	203
Palladium, statistics .....	4-6, 21
value of .....	21
Palmer, R. M. ....	120
Palmer tp. ....	207
Paluck, S. ....	98
Panache lake. <i>See</i> Penage lake.	
Papaluka, J. ....	100
Papff, Friedrich .....	19
Papin, J. ....	108
Paprenick, M. ....	102
Paragon silver mine .....	155
Pardon, Albert .....	155
Park, Hugh .....	145
Parker, W. R. P. ....	132, 134, 136
Parkhurst, A. J. ....	188
Parks, H. W. ....	26
Parks, R. T. ....	28
Parry Sound.	
Blast furnace at, photo .....	182, 187
Parry Sound Mining div.	
Recorder's notes .....	48
Pashier, J. L. ....	154
Pasianita, G. ....	98
Paterina, D. ....	100
Patno, J. G. ....	179
Paton, R. K. ....	80
Patrini, L. ....	102
Paxton & Bray .....	26, 193
Pearl Lake gold mine. ....	10, 164
Pears, John .....	186
Pears, William .....	26
Pears & Son, James .....	26
Pearson, F. S. ....	121
Pearson, James .....	184
Pearson, W. ....	82
Peat.	
Plants for working .....	33
Production .....	3-5, 33
Pecile, L. ....	74
Pedlar, W. ....	80
Pednud, G. ....	74
Peek, R. L. ....	186
Peerless Brick & Tile Co. ....	26
Pellatt, Sir Henry .....	134, 149
Pelto, E. ....	108
Penage lake.	
Description .....	220
Rocks in area of .....	219-221, 233
Penhorwood, Sydney Lewis .....	30
Penn-Canadian silver mine .....	11, 19
Accident in .....	88
Concentrating plant .....	129
Work at .....	149
Pennsylvania, U.S., autunite in .....	44
natural gas .....	259
Pentane in natural gas. ....	255
Perkins, G. A. ....	29
Perkins, J. ....	76
Pero, Louis .....	68
Perth Road lead mine.	
Accident in .....	64, 68
Work at .....	176



	PAGE
Pesqual, S. ....	78
Peterborough co., diabase .....	171
Peterson Lake silver mine .....	12, 19
Accident in .....	88
Map .....	150, 151
Work at .....	149
Photo .....	152
Petrography.	
Greywacké, near Sudbury .....	213
Rocks in Levack tp. ....	194-200
Petroleum oil-field.	
Abandoned wells, number of .....	34
Petroleum.	
Companies refining .....	34
Production .....	3-5, 34, 35
Wells, regulations concerning .....	36
Pettenuso, Joe .....	98
Petty, Chas. ....	26
Pfeifer, Prof. Ignaz .....	271
Phillion, J. ....	88
Phillips, F. C. ....	259
Phillips, R. M. ....	175
Phillips, Thos. ....	26
Philpotts, Wilfred .....	256
Phinn, Geo. E. ....	26
Phosphate of lime, production .....	5
Phthisis, miners' .....	68
Pic, A. ....	102
Pietro, T. ....	98
Pietro, V. ....	102
Pig iron. <i>See</i> Iron.	
Pignatello, A. ....	108
Pilate, C. ....	104
Pike co., analysis of natural gas .....	272
Pillow structure.	
Sudbury, photo .....	216
Pilon, A. ....	26
Piovesan, E. ....	104
Piper, Murphy & Walsh .....	26
Piri, Victor .....	78
Pitchblende, notes on .....	43, 44
Pittsfield, Ill., analysis of natural gas .....	272
Plant, David .....	175
Platinum, statistics .....	4-6, 21
value of .....	21
Platto, Frank .....	171
Pleindor Porcupine Mines, Ltd. ....	41
Plenaurnum gold mine .....	10
Point Anne .....	183
Point Anne Quarries, Ltd. ....	29, 183
Point Pelee Sand & Gravel Co. ....	42
Poirier, Emeric .....	28
Poisson, El. ....	74
Polinski, W. ....	102
Pomeroy, Robt. W. ....	132
Ponsford, A. E. ....	26, 41
Pontiac series .....	205, 230
Poole, T. A. ....	28
Poplar Lodge .....	231
Porcupine Aurum Mines Co. ....	165
Porcupine Central Development Syn. ....	42
Porcupine Crown gold mine .....	10
Capital and date of charter .....	41
Controlled by Crown Reserve Co. ....	137
Mill .....	157
Mining notes .....	8, 164

	PAGE
Officers .....	164
Photo .....	161
Porcupine gold dist.	
Chrysotile in .....	47
Diamonds in .....	47
Dividends from mines in .....	16
Labour strike in .....	73
Mining in, Inspector's report .....	157-166
Recorder's report .....	48
Timiskaming series, photos .....	230, 231
Porcupine Lake Gold Mines, Ltd. ....	165
Porcupine Miracle Mining Co. ....	163
Porcupine Syndicate & Gould Consoli- dated .....	19
Porphyry Hill gold mine .....	6, 10
Port Arthur.	
Trap rock. <i>See</i> Intercities quarry.	
Port Arthur Mining div.	
Recorder's report .....	48
Port Arthur Sand-lime Brick Co. ....	27
Port Colborne.	
Cement plant near .....	30
Furnace plant at .....	52, 171, 187
Gas at .....	246
Limestone quarrying near .....	189
Port Colborne-Welland Natural Gas & Oil Co. ....	38
Port Credit Brick Co. ....	26, 186
Port Dover, analysis of gas at .....	245, 254
Port Dover Brick & Tile Co. ....	26
Port Maitland, analysis of gas .....	245, 254
Port Rowan, gas at .....	244
Port Rowan Natural Gas Co. ....	38
Port Royal, gas at .....	245
Portland cement. <i>See</i> Cement.	
Portland tp. ....	177
Portugal, autinite in .....	44
Pottery production .....	3-5
Power City Stone Co. ....	29
Power House rapids, Madawaska river .....	178
Pre-Cambrian.	
L. Huron, N. of, paper by Coleman. 203-236	
remarks by Miller .....	201, 202
Sudbury dist., thickness .....	205
Preneveau .....	171
Preston, F. C. ....	10
Preston, S. R. ....	189
Preston East Dome Mining Co. ....	153
Price, John .....	26, 186
Prices, Ltd. ....	26, 186
Prices of silver .....	14, 15
Pridmore, Wm. ....	245
Primo, R. ....	98
Princess silver mine.	
Production .....	141
Work at .....	142
<i>See also</i> La Rose silver mine.	
Prista, J. ....	80
Procpicijki, H. ....	80
Producers Natural Gas Co. ....	38
Propane in natural gas .....	251, 255
Prosecutions under Mining Act ....	68
Prospectors for radium, hints to ....	44
Protzuk, M. ....	82
Provincial Assay office.	

	PAGE		PAGE
Report on .....	49-51	Rankin-Coe iron mine .....	172
Revenue from .....	38	Ransford, John .....	32
Provincial Natural Gas & Fuel Co. 36, 267		Ransome, H. B. ....	163
Provincial silver mine .....	19	Rantenan, Alex. ....	78
Royalties paid by .....	39	Rat-root bay, Rainy lake.....	232
Work at .....	149	Rauta, O. ....	102
Pullen, E. F. ....	21, 167	Raven falls, Raven river .....	167
Pulmotors .....	70	Rea gold mine .....	6, 10, 165
Puslinch tp. ....	192	Reaume tp., diamonds in .....	47
Putman, H. ....	104	Red lake, S.W. Patricia .....	232
Pyrites. <i>See</i> Iron pyrites.		Redington, John .....	149
Pyrrhotite.		Reeb, John A. ....	28, 29, 193
Dundonald tr. ....	47, 167	Reed, Mrs. A. ....	26
Pytyle, J. ....	100	Regusz, T. ....	104
Quansincinojak, J. ....	102	Reid, John .....	164
Quarries.		Renfrew Molybdenum Mines, Ltd. ..	42
Accidents in.....	53, 54, 58, 106-108	Renfrew White Granite Co. ....	42
List of .....	28	Reynor, George .....	184
Limestone. <i>See</i> Limestone.		Reynolds feldspar mine .....	171, 177
Quartz. <i>See</i> Dill quartz quarry.		Rice lake .....	111
Trap rock .....	111	Richards, C. S. ....	185
Quartz.		Richardson, H. W. ....	177
Dill quarry. <i>See</i> Dill quartz quarry.		Richardson & Son, James .....	26
Mines, names of .....	33	Richardson feldspar mine .....	171, 177
Production .....	2-5, 33	Rideau Silicate Co. ....	41
Quartz, Ont. ....	210	Ries, John .....	26
Quartz, Ont. ....	210	Right-of-Way silver mine.	
Queen City Pressed Brick Co. ....	41	Accidents .....	68, 74, 88, 90
Queensboro pyrites mine .....	174	Work at .....	149
Queenston Quarry Co. ....	29, 191	Rilett, David .....	26
Quigley, John .....	28	Rilett, Holme .....	26
Quigley, O. E. ....	189	Ritchie, S. S. ....	139
Quartzite.		Roads.	
Aweres tp. ....	229	Demand for better .....	170
Blind River .....	227	Material for. <i>See</i> Diabase and Trap	
Cloche mts. ....	214, 221-223	rock.	
Cutler .....	226	Robar, N. ....	86
Killarney, near, notes and photos..	223, 224	Robbins, P. A. ....	157, 159
Palmer tp. ....	207	Robbins, R. ....	104
Porcupine, photo .....	230	Robertson, J. ....	100
Ramsay lake, photo .....	233	Robertson, J. E. ....	117, 121
Sudbury mining region .....	204	Robertson & Co., D., Ltd. ....	28, 29
photo .....	213	Robihiero, J. ....	86
Wanapitell .....	211	Robillard, B. E. ....	185
Quinlan and Robertson .....	184	Robillard & Son .....	28, 29
Radio-active waters .....	45	Robinet Brick Co., Ltd. ....	26
Radium		Robyk, T. ....	90
Bonus for finding .....	42	Rochester, J. ....	84
Character of ores .....	43, 44	Rockwood .....	190
Salt associated with .....	45, 46	Roddy & Monk .....	29
Units of measurement .....	43	Rogass, P. ....	100
Rae, W. ....	84	Rogers, G. R. ....	156
Rainham tp., gas in .....	241	Rogers, R. P. ....	136
Rahkala, W. ....	78	Rogers, Fred. ....	74
Raleigh tp., gas in .....	241, 254	Rogers, F., & Co. ....	29
<i>See also</i> Kent co.		Rolston, James .....	38
Rama tp. ....	191, 193	Rolston, Ont. ....	209
Ramsay lake.		Romney oil-field production .....	35
Conglomerate .....	203-205, 233	Romney tp., gas in .....	241
Ramsden Sand, Gravel & Brick Co. ..	42	<i>See also</i> Kent co.	
Ranchink, S. ....	82	Rothwell, T. E. ....	49
Rand gold-field, miners' phthisis...69, 70		Round lake, S. of Waters tp. ....	219, 220, 233
Ranislo, F. ....	78	Royalties. <i>See</i> Mining royalties.	
		Rsepa, Paul .....	98
		Russell, Joseph .....	26
		Russia.	
		Analysis of natural gas from .....	271

	PAGE
Russell Brick & Tile Co. ....	26
Rutherford tp.	
Rocks in. <i>See</i> Killarney.	
Ruyich, T. ....	82
Ryan & Co., T. M. ....	26
Saari, E. ....	78
Saari, Robt. ....	76
Sabatino, P. ....	98
Sacrapanti, P. ....	98
Sacrapenti, B. ....	98
St. Anthony gold mine ....	9, 10
St. Augustine seminary, York, Ont. ....	246
St. David ....	191
St. Joseph island, L. Huron ....	112
St. Mary's ....	30, 191, 192
St. Mary's Horse Shoe Quarry ....	29, 191
St. Mary's Portland Cement Co. ....	192
Sals, A. ....	80
Salt.	
Associated with radium ....	45, 46
Producers, names of ....	32
Production ....	3-5, 32
Salt Creek, Wy., analysis of natural gas ....	272
Saltfleet tp. ....	189, 193
Salvatone, R. ....	80
Salvator Silver Mines, Ltd. ....	41
Sampling of natural gas, methods of. ....	239
Sampson, P. ....	90
Sand.	
List of concerns excavating ....	193
Statistics ....	3-5
Sand, Lime, Brick Co. ....	110
Sanders, O. ....	108
Sandstone quarries, list of. ....	28, 29
Sarcangelo, S. ....	100
Sault Ste. Marie. <i>See</i> Algoma Steel Corpn.	
Sault Ste. Marie Mining div.	
Recorder's report ....	48
Sault Ste. Marie railway.	
Sudbury series along ....	224, 225
Savage silver mine. <i>See</i> McKinley-Darragh-Savage.	
Scarborough tp., gas in ....	246, 247
Scarnecki, F. ....	104
Schaefer Brick Co. ....	26
Schelle, Prof. ....	271
Schelling, R. F. ....	187
Schlardo, Wasyl ....	82
Schmidt, H. W. ....	46
Schneeberg, Saxony.	
Radio-active waters ....	45
Schreiber, nickel N. of. ....	110
<i>See also</i> Duck lake.	
Schultz Bros. ....	27
Schumacher gold mine ....	165, 166
Schwartz, C. E. ....	176
Schweizergang Quelle, Germany ....	43
Schwendiman, F. W. ....	193
Sclater, James ....	192
Scobie, B. ....	80
Scott, James M. ....	26
Scott, John ....	34
Scott, Thomas ....	84
Scott Bros. ....	178
Scramble gold mine. <i>See</i> Canadian	

	PAGE
Homestake gold mine.	
Scriven & Whyte ....	34
Szczesny, W. ....	98
Segsworth, R. H. ....	153
Segsworth, W. E. ....	153
Seibert, F. M. ....	247, 251
Seine river, rocks on ....	205, 232
Selemba, A. ....	82
Selkirk, J. ....	96
Sellampa, J. ....	80
Sellwood. <i>See</i> Moose Mountain iron mine.	
Seneca Superior silver mine ....	19
Dividends ....	17, 129
Officers ....	153
Production ....	11, 18
Rich veins ....	12
Work at ....	153
Seneca tp., gas ....	245, 254
gypsum ....	188
Seneridge, F. ....	98
Sepponen, M. ....	82
Serefini, T. ....	74
Serpent river, L. Huron ....	226
Serpentine in Porcupine dist. ....	47
Servioni, J. ....	78
Sessila, J. ....	108
Sewer pipe production ....	3-5
Seymour, George ....	
Seymour Electric Co. ....	175, 176
Shakespeare gold mine ....	225
Sharon Mines, Ltd. ....	41
Sharp, A. L. ....	118
Sharpe, Donald ....	36, 244, 245
Shaw, John ....	132
Shebandowan lake.	
Hematite on ....	48
Shepp, Col. Daniel B. ....	170
Sheppard, H. E. ....	48, 49
Sheppard, W. J. ....	154
Sherrill, C. L. ....	139
Sherrill Porcupine Gold Mines, Ltd. ....	41
Shock, H. L. ....	183
Shock, L. ....	86
Shovel, William ....	170
Shute, W. G. ....	78
Shuttleworth, J. M. ....	33
Shuttleworth, T. S. ....	154
Shuttleworth & Co. ....	26
Shutva, S. ....	84
Sibley, Harper ....	144
Sibley, Hiram W. ....	144
Siderite.	
Magpie iron mine ....	21, 124
Helen iron mine ....	112
Signoretta, O. ....	102
Signoretti, S. ....	102
Silampi, C. ....	88
Silas, Wm., E. & S. ....	34
Silicate Brick Co. ....	27
Silicosis in Transvaal mines ....	70
Silver.	
Cobalt dist. ....	10-17
Companies producing, list of ....	19
Markets and prices ....	14
Mining, Inspector's report. ....	111, 129-157
Smelters ....	13, 14

	PAGE
Silver Bar silver mine .....	11, 19, 153
Silver Cliff silver mine.	
Concentrating plant .....	129
Silver lake .....	155
Silver Leaf silver mine .....	137
Silver Queen mine. <i>See</i> Aladdin mine.	
Silvestri, H. ....	102
Simon, Angelo .....	82
Simpson, R. ....	136
Sinden, L. H. ....	26
Sipprell, J. H. ....	26
Sipprell, J. G. ....	138
Sjokvist, P. ....	74
Skill, Albert .....	48
Skinner, S. ....	86
Skobiato, K. ....	84
Slate islands, L. Superior .....	231
Slaughter, B. G. ....	113
Sloan, David .....	165
Small, J. D. ....	189
Small, Sydney .....	154
Smelters.	
Accidents in .....	94-104
Belleville (electric) .....	179
Cobalt dist. ....	12, 13
Coniston . . . . .	112, 120, 121
Kingston .....	176
Victoria mine .....	120
Smeltzer, J. H. ....	120
Smith, Alex. H. ....	170
Smith, Allan G. C. ....	26
Smith, E. ....	88
Smith, G. T. ....	48, 49
Smith, H. T. ....	186
Smith, J. S. ....	28
Smith, John .....	78
Smith, Peter .....	76
Smith, W. J. ....	28
Smith, W. W. ....	26
Smith, William .....	31
Smith & Co. ....	30
Smith & Son, Alex. ....	26
Smith Bros. ....	26
Smithfield, Utah, natural gas .....	272
Smuk, J. ....	90
Smythe, H. V. ....	110
Snead, J. A. ....	179
Snelgrove & Teers .....	26
Snider, J. ....	84
Snizek, S. ....	98
Snively, F. L. ....	38
Snowden tp., iron-ochre in .....	44
Soczuk, M. ....	78
Sodalite . . . . .	170
Solid Silver mine .....	170
Somers, O. ....	104
Somerville tp. ....	183
Soposki, N. ....	104
Souter & Co., G. S. ....	26
South Africa, miners' phthisis .....	69, 70
South America, silver production ...	14
South Australia, carnotite in .....	44
South Carolina, U.S.A., autunite in ..	44
South Crosby tp. ....	34
South Lorrain tp.	
Silver production .....	11
mining . . . . .	156

	PAGE
Southern Ontario Gas Co. ....	38, 41
Spanish, Alg. ....	226
Spanish river, rocks on ...	203, 221, 226
Spar. <i>See</i> Feldspar.	
Spawning lake .....	156
Spragge, Alg. ....	226
Spranka, G. ....	76
Sproat, Wm. M. ....	26
Spry, W. L. ....	48
Stalmuk, Mytro .....	76
Stamford .....	106
Standard Brick Co., Ltd. ....	26, 186
Standard Chemical, Iron & Lumber Co. ....	28
Standard Crushed Stone Co. ....	42
Standard Iron Co. ....	22, 182, 187
Standard Natural Gas Co. ....	38
Standard Oil Co. of Canada .....	38
Standard Smelting & Refining Co. ...	14, 20
Standard White Lime Co. ....	28, 192
Stansfield, Dr. <i>See</i> Evans-Stansfield.	
Starr, J. R. L. ....	144
Station, Ivan .....	76
Statistical Review, by Gibson .....	1-48
Steajka, M. ....	102
Steel production .....	22
Steel Company of Canada .....	22
Accidents at plant of .....	93, 96, 104
Pulmotor of .....	70
Work by .....	187
Steele, Edwin .....	26
Steele, Joseph .....	245
Steepphill falls, Magpie river .....	113
Photo . . . . .	126
Sterling Gas Co. ....	38
Stevens, A. E. ....	186
Stewart, J. H. M. ....	183
Stewart & Hewitson. <i>See</i> Inter-Cities Quarry Co.	
Stickwood, Chas. ....	26
Stingle, G. ....	84
Stobie nickel mine, greywacké .....	213
Stocco, Gutano .....	98
Stone, Frank .....	76
Stone, building. <i>See</i> Building material.	
Stoness, J. M. ....	34, 177
Stoness, Anglin & Gilbert .....	178
Stoney Creek .....	189
Storms, G. ....	104
Stovel, J. H. ....	119
Stratford Brick, Tile & Lumber Co. ...	26
Strikes at Coniagas mine .....	130
Striko, M. ....	102
Stroh, Henry .....	26
Strutt, R. ....	104
Sturgeon, R. ....	88
Sturgeon lake, Th. B. d.	
Gold mining at .....	6
Sudburite.	
Analysis, photo and notes .....	215-217
Levack tp. ....	194-196
Named by Coleman .....	201
Sudbury.	
Rocks at and near .....	204, 211-213
Greenstone, photo .....	215
Lava, photo .....	216
Sudbury Brick Co. ....	26



	PAGE
Sudbury mining div.	
Geology of .....	204-236
Labour in .....	73
Nickel mining .....	112-121
Recorder's report .....	48
Sales and leases .....	39
Sudbury series.	
Description .....	236
L. Huron, N. of .....	203
age .....	204
notes .....	211-229
L. Superior, W. of .....	232
Nipigon Lake reg. ....	231
Sudbury nickel reg. ....	230, 231
Sulphide, Ont. ....	174
Sulphide Chemical Co. ....	31, 42, 174
Sulphide of hydrogen. <i>See</i> Hydrogen sulphide.	
Summerhayes, M. W. ....	164
Summons, Dr. Walter .....	69
Sun Brick Co. ....	26, 108, 186
Superior Brick Co. ....	26, 110
Superior Portland Cement Co. ....	30
Superior Sand & Towing Co. ....	42
Supie, Ivan .....	82
Supplementary Revenue Act. <i>See</i> Mining Tax Act.	
Surridge, F. ....	26
Sutherland, T. F. ....	53
Report by, on Mines of Ontario. ....	110-193
Mining accidents. ....	53-109
Sutherland Construction Co. ....	42
Swajozika, J. ....	76
Swastika and Kirkland Lakes area. <i>See</i> Kirkland and Swastika.	
Switch, F. ....	100
Sydenham .....	34
Sydenham tp. ....	190
Sylvanite gold mine .....	9
Capital and date of charter. ....	42
Work at .....	170
Szalyone, M. ....	84
Szczuck, O. ....	78
Taggart, Thos. ....	177
Taggart mica mine .....	34, 177
Talc, mines, names of .....	33
Mining notes .....	174, 175
Production .....	3-5
Tall, T. ....	88
Tannahill, R. ....	104
Taylor, G. ....	102
Taylor, George .....	139, 159
Taylor, J. Frater .....	121, 124
Taylor, James .....	26
Taylor & Hall .....	26
Taylor Bros. ....	26
Teck-Hughes gold mine .....	10
Capital and date of charter .....	42
Mining notes .....	9, 170
Photo .....	169
Teck tp. ....	139
<i>See also</i> Wright-Hargraves.	
Telephone City Oil & Gas Co. ....	38
Temagami Chief Mines, Ltd. ....	42
Temiskaming. <i>See</i> Timiskaming.	

	PAGE
Temiskaming Hudson Bay Mfg. Co.	
Dividends .....	17
Dome Lake mine controlled by. ....	159
Temiskaming Mining Co. ....	17, 19, 163
Temiskaming silver mine .....	19
Accidents .....	59, 74, 90
Concentrating plant .....	129
Production .....	11
Work at .....	153
Tereske, M. ....	74
Terra Cotta Pressed Brick Co. ....	26, 193
Tett mica mine .....	34, 178
Thames Quarry Co. ....	29, 192
Thayer, Wallace .....	153
Thessalon, Ont.	
Rocks, conglomerate ..	205-207, 228, 232
lavas .....	229
Thiebault, Adeldard .....	29
Thoenen, Mr. ....	120
Thomas, J. ....	102
Thomas, T. R. ....	190
Thompson, W. L. ....	144
Thompson-Gowganda claim .....	156
Thomson, William .....	191
Thopolnitski, N. ....	90
Thorne, Stuart M. ....	153
Thornham, J. F. ....	167
Thornton, John .....	26
Thorold .....	12, 14, 189, 193
Three Nations gold mine ....	10, 165, 166
Thunder bay, L. Superior. ....	235
Thunder Bay Contracting Co. ....	29
Thunder Bay mining div.	
Sales and leases .....	39
Tierney, D. ....	102
Tietz, Wm. A. ....	29
Tilbury, East, tp., gas in .....	243
Tilbury gas-field. <i>See</i> Kent gas-field.	
Tilbury oil-field production. ....	34, 35
Tile factory, Kingston .....	171
Tile production .....	3-5
Timiskaming mining div.	
Recorder's report .....	48, 49
Sales and leases .....	39
Timiskaming series.	
L. Huron, N. of .....	203
Porcupine, photos .....	230, 231
<i>See also</i> Sudbury series.	
Timmins, L. H. ....	157
Timmins, Noah .....	159
Tisdale tp.	
Gold mining in. <i>See</i> Dome, Hollinger, Porcupine gold mines.	
Titaniferous iron ore.	
Analysis of .....	181
Smelting of .....	179-181
Tivani Electric Steel Co. ....	179-181
Tobin, O. ....	80
Todd, Eldoras .....	30
Toderico, B. ....	78
Todman, W. ....	98
Tonkin, H. G. ....	179
Tonkin, J. J. ....	179
Tonkin-Du-Pont Graphite Co. ....	33, 42, 179
Tonuto, D. ....	102
Topp, James .....	245

	PAGE
Toronto.	
Assay office removed to .....	49
Gas in .....	246
analysis .....	254
Toronto Brick Co. ....	27, 184
Toronto Clay Products, Ltd. ....	42
Toronto Lime Co. ....	28, 192
Toronto Pressed Brick & Terra Cotta Co. ....	26, 193
Tough, R. J. ....	138
Tough-Oakes gold mine .....	6, 19
Capital and date of charter .....	42
Mining notes .....	9, 168
Production .....	169
Shafthouse, photo .....	168
Toving, I. ....	80
Transvaal, miners' pneumonia in ....	69, 70
Trap rock.	
Bruce Mines .....	127
For roads .....	171
Quarries, names of .....	28, 29
Port Arthur .....	111, 112
Preneveau .....	184
<i>See also</i> Inter-Cities quarry.	
Travers, E. ....	102
Traverse, H. ....	102
Tremain, H. E. ....	130
Trenton.	
Concentrating plant at .....	172
Trenton Electric Co. ....	173
Trenton formation, gas in .....	246
analysis .....	265
Trepoli, J. ....	80
Trethewey silver mine .....	19
Accident .....	90
Concentrating plant .....	129
Dividends .....	17
Fuse troubles .....	66
Mining notes .....	154
Production .....	11
Trethewey Silver Cobalt Mines, Ltd. ....	111
Trottier, J. ....	88
Trottier, O. ....	102
Trousdale, J. W. ....	34
Trout Creek Gold Mines, Ltd. ....	42
Trout lake, Boswell tp.	
Conglomerate .....	235
Troutman, P. ....	76
Trtanz, J. ....	76
Tudhope, Jas. B. ....	154
Tudhope tp.	
Silver mining. <i>See</i> Cobalt Frontenac.	
Tummon, W. E. ....	184
Tures, Louis .....	108
Turnbull, Robt. ....	26, 223
Turnbull, W. ....	76
Twanschak, P. ....	100
Tweed Quarries, Ltd. ....	29, 184
Tyler, West Virginia .....	261
Uhlaniouy, W. ....	88
Union Natural Gas Co. ....	38, 267
United Gas & Fuel Co. ....	38
United Gas Companies, Ltd. ....	38
United States.	
Autunite .....	44
Carnotite .....	44

	PAGE
Gas, analyses from various states..	272
Silver production .....	14
United States Cobalt Mining Co. ....	90
United States Steel Products Co. ....	42
University silver mine .....	144
Uran-ochre .....	44
Uraninite, notes on .....	43, 44
Uranium.	
Minerals bearing, notes on .....	43, 44
Urannibate .....	43
Urin, Biglig .....	74
Utah, U.S.A., autunite and carnotite.	44
natural gas .....	272
Van der Voort, M. P. ....	163
Van Hise, Charles R. ....	229
Vansickle, A. W. ....	38
Variarock, N. ....	80
Vascla, J. ....	104
Vaughan Sand & Gravel Co. ....	42
Vellonois, G. ....	88
Ventilation of mines .....	70, 71
Vermont Marble Co. ....	42
Victor nickel mine .....	121
Victoria creek .....	9
Victoria nickel mine .....	20
Accidents in .....	66, 74, 88
Smelter dismantled .....	120
Greywacké .....	213
Viele, M. A. ....	145
Vienna, Ont., gas at .....	244
Villeneuve mica mine, Que. ....	43
Vincenzo, B. ....	76
Vinemsunt quarry. <i>See</i> Wentworth Quarry Co.	
Vinzelli, E. ....	74
Violet silver mine .....	144
Vipond gold mine .....	10
Virginio, C. ....	76
Viscosity of natural gas .....	266
Vitoria, Z. ....	108
Vittorio, T. ....	100
Voakes, Ed. R. ....	26
Voller, A. ....	272
Volumick, John .....	96
Vorkopan, M. ....	82
Vulcan iron mine .....	207
Wadsworth, C. ....	74
Wadsworth Lake Mining Co. ....	42
Wager, George .....	176
Wagstaff, A. H. ....	26, 106, 108, 186
Wahnapiatae Power Co. ....	9, 121
Waide Bros. ....	26
Wainnes & Root Gas Co. ....	38
Wainfleet tp. ....	193
Waite, F. ....	104
Waite, J. E. ....	26
Waka, A. ....	80
Waldman silver mine.	
Royalties paid by .....	39
Walicki, S. ....	98
Walker, A. ....	70
Walker, David .....	193
Walker, Dr. T. L. ....	201, 204, 208, 209
Walker lake, S. of L. Penage .....	221
Wallace & Son, R. ....	27

	PAGE
Wallaceburg Gas Co. ....	42
Wallaceburg Oil Refining Co. ....	42
Waller, J. ....	84
Wallingford Mining & Mica Co. ....	178
Waloshuk, George ....	76
Walpat, S. ....	82
Walpole tp.	
Gas in, analysis ....	245, 254
Limestone quarry ....	190
Walsh Mines, Ltd. ....	157
Walter, B. ....	272
Wanapitei, garnet-gneiss ....	211
granite-gneiss ....	208
quartzite ....	211-214
Wanapitei river.	
Rocks ....	210, 214
Waterpower ....	121, 211
Wanup ....	210
Wapoose Mines, Ltd. ....	42
Ward, William P. ....	141
Warde, D. ....	192
Wardle, John ....	27
Wasabika Mines, Ltd. ....	42
Washington, U.S., natural gas in...	273
Water.	
Effect of, on natural gas ....	267
Oxygen in, behaviour of ....	268
Waterfall, Ont. ....	210
Waterloo Brick & Tile Co. ....	27, 42
Waterpower.	
Cobalt camp ....	129
Madawaska river ....	178
Magpie river ....	113, 126
Montreal river ....	129
Raven river ....	167
Wanapitei river, photo of plant...	211
Watson, C. E. ....	134, 136
Watson, J. F. ....	134
Watson, J. P. ....	134, 136
Watson, R. G. ....	141, 145
Watson, R. H. ....	182, 188
Watson Brick Co. ....	27
Watterworth, Chas. ....	27
Watts, Edward ....	34
Waulff, A. ....	100
Waurio, S. ....	80
Wavy lake, S. of Waters tp. ....	218
Wawa gold dist. ....	113
Wazniz, M. ....	74
Weaver, Ben. ....	183
Webb, Geo. F. ....	29
Webb, W. M. ....	30, 193
Webbwood ....	225
Webster, James ....	29
Webster, Keith. <i>See</i> Oliver & Webster.	
Wedrick, M. ....	38
Weed, Floyd ....	130
Weese, Ben. ....	108
Wehlann & Son ....	27
Weigel, W. M. ....	176
Welk, Herman ....	29
Welland co.	
Gas in ....	245
analysis ....	252, 254
character ....	265
price ....	267
production ....	35

	PAGE
notes ....	244
Welland County Lime Works Co. ....	38, 193
Wellington, Steven ....	175
Wellman, Albert ....	28
Welsh, Joseph P. ....	155
Wenstrom, J. F. ....	165
Wentworth co., oil in ....	36
Wentworth Quarry Co. ....	29, 193
Accident ....	106, 108
Wentworth tp., gas in ....	245
analysis ....	254
Weppler, Henry ....	27
West, W. C. ....	149
West Bros. ....	27
West Beaver silver mine ....	115, 154
West Shining Tree dist.	
Development work ....	112
West Virginia, U.S.	
Natural gas ....	260, 261
Western Canada Flour Mills Co. ....	32
Western Salt Co. ....	32
Westerpakka, J. ....	73
Westlake, E. H. ....	141, 157
Weston, ....	68
Wettlaufer-Lorrain silver mine ....	11, 19
Concentrating plant ....	129
Dividends ....	17
Officers ....	157
Work at ....	157
Wetzel, West Virginia ....	261
Wheeler, G. W. ....	155
Wheeler, J. L. ....	153
Whiskey lake ....	231
Whistle nickel mine ....	121
Whitbeck, Ernest C. ....	153
White Jacket fuse ....	66, 67
Whitefish, Ont.	
Quartzite near, photo ....	222
Whitefish river, L. Huron ....	221, 222
Gold prospects ....	224
Quartzite ....	224
Whitehead, H. ....	116
Whitewater series ....	234, 235
Whitney, J. D. ....	44
Whitney tp. ....	165
Wilcox, H. ....	88
Wilcox, S. ....	86
Wilcox Lake Brick Co. ....	27
Willett tp. ....	155
Williams, C. E. ....	189
Wickett, S. R. ....	154
Wilberforce, Ont. ....	178
Williams, J. P. ....	111
Willmott, A. B. ....	33, 174, 223
Willoughby tp., gas in ....	246
analysis ....	254
Wilson, G. S. ....	29
Wilson, Gordon ....	98
Wilson, John ....	156
Wilson, Morley ....	205, 230
Wilson, O. ....	88
Winchell, Alexander ....	206
Windecker, R. ....	245
Windsor Sand & Gravel Co. ....	42
Wiser & Sons, Ltd., J. P. ....	27
Wisner tp. ....	200
Wista, Waino ....	76

	PAGE
Woodlefesky, J. ....	86
Woodruff, Welland D. ....	136
Woods, W. H. ....	27
Woodworth, K. D. ....	156
Worthington nickel mine.	
Greywacké .....	213
Head-frame, photo .....	119
Mining notes .....	112, 120
Wright, S. B. ....	179
Wright, Samuel .....	27
Wright, Spencer D. ....	149
Wright & Robbins claims. <i>See</i>	
Sylvanite gold mine.	
Wright Bros. ....	27
Wright-Hargraves gold mine.....	9, 169
Wuori, Sam. ....	78
Wyandoh Mining Co.	
Royalties paid by .....	39
Wylie, J. B. ....	100
Wyoming, U.S.	
Gas in, analysis .....	271, 272
Yaeck, Louis .....	27
Yarvii, E. ....	74
Yates, Harry .....	187
Yates gravel pit, Hamilton .....	193

	PAGE
Yellowstone park, U.S.A., radio-active	
waters .....	43
Yinkoski, N. ....	80
Yonge st., Toronto .....	246
York, E. H. ....	168
York, Ont. ....	185
York co.	
Gas in .....	246
analysis .....	254
character .....	265
York-Ontario silver mine.....	154
York Sand & Gravel Co. ....	106, 108, 185
York Sandstone Brick Co. ....	27
Young, H. G. ....	154
Young, W. ....	82
Yuan Shi Kai .....	15
Yuka, H. ....	80
Yusela, Y. ....	82
Zaich, M. ....	52
Zardo, B. ....	80
Zenelea, L. ....	102
Zinc statistics .....	5, 6
Zoller, F. W. ....	153
Zorzi, R. ....	98
Zrenck, N. ....	84



REPORT OF THE ONTARIO BUREAU OF MINES,  
VOL. XXIII, PART 2

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# The Kirkland Lake and Swastika Gold Areas

AND

MAISONVILLE, GRENFELL AND EBY  
TOWNSHIPS

BY

A. G. BURROWS and PERCY E. HOPKINS

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# CONTENTS

	PAGE		PAGE
The Kirkland Lake and Swastika		The Swastika Area .....	20
Gold Areas .....	1-32	Kirkland Lake Area .....	21
Previous Exploration of the Region	2	Minerals in Kirkland Lake Veins.	21
Geology .....	4	Tellurides and Gold .....	23
Keewatin .....	4	Microscopic Examination of Ore.	24
Keewatin Diabase .....	6	Development .....	25
Feldspar-Porphyry .....	6	Tough-Oakes Mine .....	25
Quartz-feldspar Porphyry ....	8	Burnside .....	29
Dolomite .....	8	Teck-Hughes .....	30
Iron Formation .....	8	Wright-Hargrave .....	31
Timiskaming Series .....	9	Sylvanite (Wright and Robbins)	31
Sections of Greywacké .....	10	Oakes .....	31
Variety of Pebbles in Con-		Gold in other Townships .....	31
glomerate .....	10	Copper Ore .....	32
Post-Timiskaming Intrusives ...	12	Acknowledgments .....	32
Lamprophyre .....	12	Maisonville, Grenfell and Eby.....	33
Analyses of Lamprophyre ....	12	Economic Notes .....	34
Syenite .....	12	Gold .....	34
Granite .....	14	Lead and Zinc .....	34
Feldspar-Porphyry .....	15	Iron Pyrites .....	34
Cobalt Series .....	17	More Recent Discoveries of Gold	
Diabase .....	17	in Maisonville .....	34
Origin and Age of Gold Deposits..	18	Bibliography of the Kirkland Lake	
		and Swastika Gold Areas.....	35

## ILLUSTRATIONS

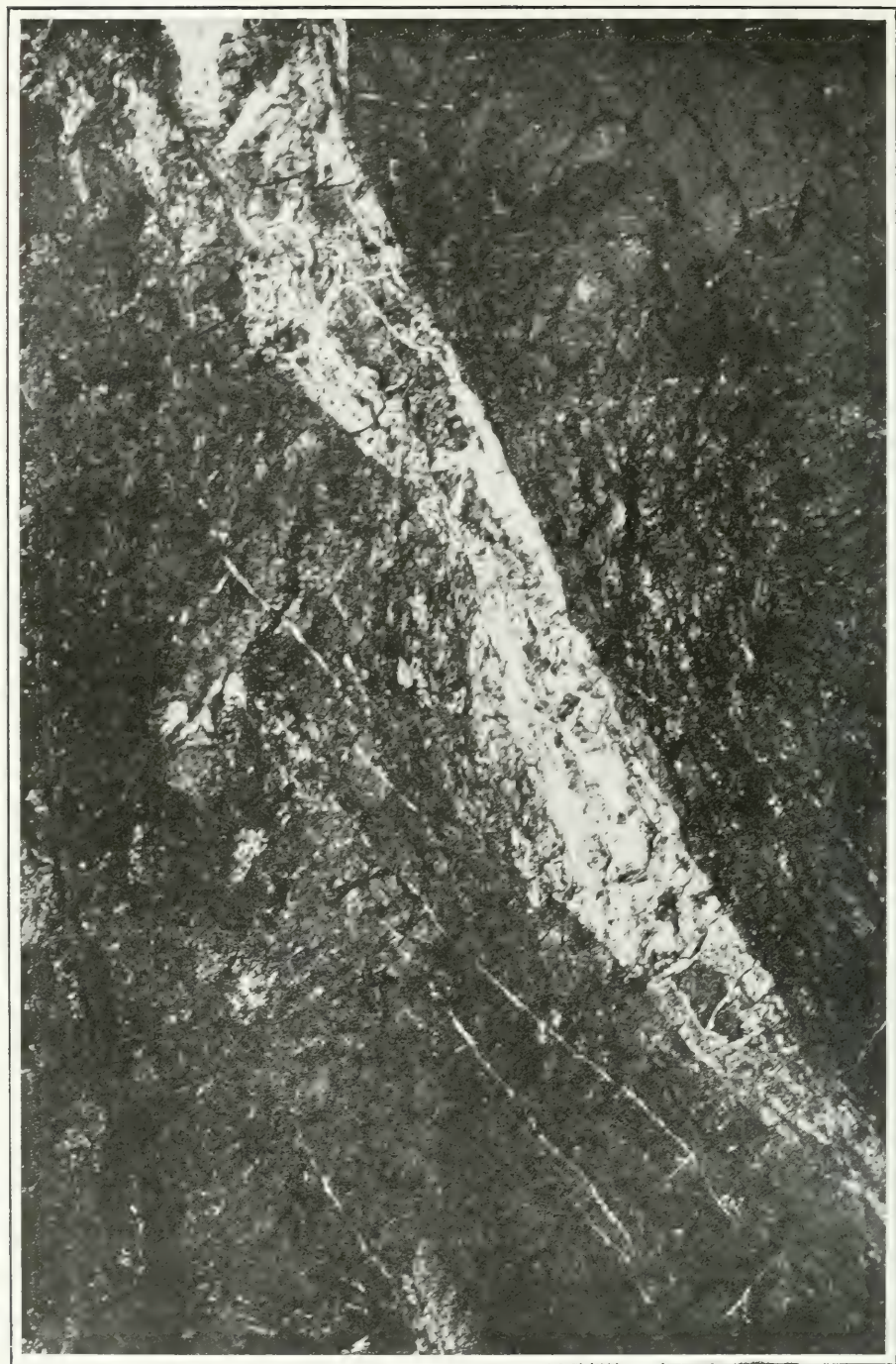
	PAGE
Tough-Oakes Mine, No. 3 Vein.....	Frontispiece.
Scene on Amikougami Lake .....	2
Scene on Blanche River, McElroy Township.....	3
Scene on Kirkland Lake .....	3
Scene on Blanche River, McElroy Township .....	5
Scene on Amikougami Lake .....	7
Ellipsoidal Greenstone, Amikougami Lake .....	7
Unconformity between Timiskaming Series and Keewatin Diabase.....	9
Conglomerate of Timiskaming Series which has been rendered highly schistose....	11
Timiskaming Series exposed on Dane-Larder Lake Road .....	13
Iron Formation of the Timiskaming Series .....	13
Lamprophyre Dike on Wishman claim.....	14
Conglomerate of Timiskaming Series intruded by Lamprophyre and Feldspar-porphry .....	16
Photomicrograph of reddish Feldspar-porphry .....	16
Photomicrograph of greenish Feldspar-porphry .....	17
Scene on Kirkland Lake .....	17
View of Blanche River, Otto Lake and Swastika Mine .....	17
Prospecting on Blanche River .....	19
Gold-bearing Quartz showing the brecciation of the primary quartz and the deposition of pyrite and gold, along fracture lines, Swastika Mine .....	20
Gold-bearing Ore from Vein No. 2 in the Conglomerate, Tough-Oakes Mine .....	22
" " " " " "	22
Thin Section of Gold-bearing Quartz from Vein on Wright-Hargrave .....	23
Thin Section of Gold-bearing Quartz from No. 2 Vein, Tough-Oakes Mine .....	24
Plan of Tough-Oakes and Burnside Mines .....	26
Surface Plant at No. 2 Vein, Tough-Oakes Mine .....	27
Tough-Oakes Mine, Plan of Underground Workings .....	28
A narrow Part of No. 2 Vein in the Conglomerate, Tough-Oakes Mine .....	29
No. 1 Vein, Teck-Hughes Mine .....	30
Saw Mill at Huronian Mine .....	31
Shaft on Quartz Vein, carrying Copper Pyrites .....	32
A Scene on Lower Twin Lake, Maisonneville Township .....	33

## MAPS

- Kirkland Lake and Swastika Gold Areas (Map No. 23a). Scale,  $\frac{3}{4}$  mile to 1 inch. Geologically colored.
- Maisonville, Grenfell and Eby (Map No. 23b). Scale,  $\frac{3}{4}$  mile to 1 inch. Geologically colored.







Tough-Oakes Mine, No. 3 vein as exposed on the east side of the shaft between depths of 61 and 67 feet. The vein is in the porphyry, the fractured character of which is shown in the illustration.

# THE KIRKLAND LAKE AND SWASTIKA GOLD AREAS

By A. G. Burrows and P. E. Hopkins.

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The Kirkland Lake and Swastika Gold Areas are in the district of Timiskaming, about fifty miles north of Cobalt. As shown by the accompanying map, the main line of the Timiskaming and Northern Ontario railway runs through the southwestern portion of the areas. A small town has sprung up at Swastika station, at mileage 164, where the railway crosses the Blanche river. A good wagon road has been constructed by the Ontario Government from the town in a northeasterly direction to the Tough-Oakes mine, a distance of about seven miles. This road passes by the south shore of Kirkland lake. Swastika station by rail is 390 miles north of Toronto.

The areas which have been mapped include the townships of Otto, Teck, Lebel, Boston, McElroy and Gauthier (Map No. 23a). Portions of McElroy, Gauthier and Boston were not examined.

During part of 1911 Mr. E. L. Bruce examined an area in the vicinity of Swastika in which are situated the Swastika and Lucky Cross mines. In 1912 and 1913 further geological work was done, special attention being given in 1913 to the region around Kirkland lake, where numerous gold-bearing quartz veins had been discovered. A great part of the area around Swastika and eastward to Larder lake was staked during the rush into Larder lake in 1906, in the boom days of Cobalt. Most of these claims were, however, abandoned before much work had been done.

Gold was first found in a vein on the north shore of Otto lake on a claim which is now part of the Swastika mine group. In 1911 the metal was discovered in several veins to the north of the railroad and just east of Amikougami creek. These discoveries were later developed by the Lucky Cross Mining Company. Beyond these two properties there has been little development in the Swastika area apart from prospecting on a number of claims. The claims which were staked in the Larder lake rush and abandoned have been restaked, and important gold discoveries made. The first discovery in the Kirkland Lake area was on the Wright-Hargrave claim to the east of the lake. Gold was found in the quartz veinlets which traverse the reddish feldspar-porphry. In January, 1912, gold-bearing veins were found in the porphyry and the conglomerate on the Tough-Oakes claims, three-quarters of a mile northeast of Kirkland lake. However, very little interest was taken in the Kirkland lake area in 1912, but the development of No. 2 vein of the Tough-Oakes group and the shipment of high-grade gold ore from this property caused great interest in the area in 1913, and much surface trenching resulted in the finding of a number of promising veins. During the year a number of shafts were sunk and some drifting done on certain veins.

The areas are situated just south of the height of land between the Hudson Bay and the St. Lawrence River waters. The altitude on the average is about 1,050 feet. The station at Swastika is 1,007 feet above sea level. The hills are seldom more than 100 feet above the surrounding country. Very little of the country is suitable for agriculture, as rock exposures are abundant or concealed by sand plains or swamps. Generally speaking, the timber is small, since a great part of the area was burned over about fifty years ago. Charred stubs of the old forest are frequently seen, indicating an old red and white pine forest with large sized trees. The present timber is spruce, pitch pine, birch, poplar, balm of Gilead, balsam and cedar. The rocky ridges are

clothed with scrubby pitch pine, while in some of the lower parts, where there is more or less soil, there are spruce and poplar trees of considerable size. This fair-sized timber is utilized for building and mine purposes. Sand plains and rolling sand ridges with a growth of pitch pine are characteristic of a great part of Gauthier township south of Victoria lake. The country is drained by the Blanche river, and its tributaries, which flows southward, finally emptying into Lake Timiskaming. There are several clear water lakes in the area, the largest of which is Round lake. Some of the smaller lakes, such as Amikougami, Gull and Kirkland, are quite picturesque. These lakes contain the usual pike and pickerel so common in northern waters, while lake trout are plentiful in Crystal lake, a beautifully clear water lake in Lebel township.

### Previous Exploration of the Region

The first description of this area was given by Mr. W. J. Wilson, who, in 1901<sup>1</sup> made a reconnaissance survey of the Blanche river for the Geological Survey of Canada.

In the Eleventh Report of the Bureau of Mines<sup>2</sup> Dr. W. G. Miller described a part of the area. The geology of the northeast branch of the Blanche river through the townships of McElroy and Gauthier is described, as is also that of Beaverhouse lake and Victoria lake, the latter being called Quasis lake.



Scene on Amikougami lake showing glaciated island with drift removed from N.E. end.

In 1902<sup>3</sup> Mr. L. L. Bolton, acting as geologist with O. L. S. Speight's survey party, gave a description of the geological and other features of an area from Round to Abitibi lakes. Mr. Bolton followed the water route, so that his information is necessarily confined to a narrow stretch of country. He gives a description of rocks along the Blanche river, which flows from Sesekinika and Kenogami lakes, and also of the portage route from Sesekinika lake to Amikougami lake. In Bolton's report Amikougami lake is called Lake Anikojigami, which name implies "a collection of lakes joined by narrow passages."

In the Fourteenth Report of the Bureau of Mines<sup>4</sup> W. G. Miller described the geology of a portion of the township of Boston, in which an iron range had been discovered a few years previous: "The iron formation or jaspilite of Boston is similar in character to that of Temagami and to those of other parts of Ontario such as the Hutton township range north of Sudbury, and the Vermilion range of the state of Minnesota." Other formations referred to are the greenstones, syenites, conglomerate and later trap dikes, which are shown on the accompanying map.

<sup>1</sup> Geol. Survey of Canada, Vol. XIV, 117A to 130A.

<sup>2</sup> "Lake Temiskaming to the Height of Land," 11th Report, Bureau of Mines.

<sup>3</sup> "Round Lake to Abitibi," 12th Report, Bureau of Mines.

<sup>4</sup> "Boston Township Iron Ranges," 14th Report, Bureau of Mines.





Scene on Blanche river, McElroy township.



Scene on Kirkland lake.

## Geology

The rocks of the area may be classified as follows:

### Glacial and Recent

Stratified clay, sand, gravel and other material

### Pre-Cambrian

LATER DIKES .....Diabase  
(*Intrusive contact*)

COBALT SERIES .....Conglomerate  
(*Unconformity*)

POST-TIMISKAMING INTRUSIVES	{	Granite, syenite, feldspar-porphyry. ( <i>Intrusive contact</i> ) Lamprophyre.
( <i>Intrusive contact</i> )		

TIMISKAMING SERIES      Quartzite, greywacké, conglomerate, with schistose derivatives.  
(*Unconformity*)

KEEWATIN      Greenstone (basalt, andesite, etc.), diabase, quartz-porphyry, feldspar-porphyry, iron formation, dolomite.

In the following notes are given descriptions of the various groups of rocks:

### KEEWATIN

Of the rocks of the area those of the Keewatin system have the widest distribution, and they are usually of the greenstone type, either massive or schistose. Where massive they are of a pale greenish color on the weathered surface and, especially when accompanied by the ellipsoidal or amygdaloidal structure, are readily recognized in the field. There is a large volume of greenstone in the vicinity of Amikougami lake and also along the T. & N. O. railway southeasterly from Swastika as far as Boston creek. At places in the latter area the greenstone is intruded by syenite and lamprophyre dikes. The greenstones are sometimes quite schistose and rusty in appearance. Since some of the fine-grained rocks of the Timiskaming series are also schistose, it has been found difficult to distinctly classify certain rocks when occurring near the contact of the Timiskaming and Keewatin.

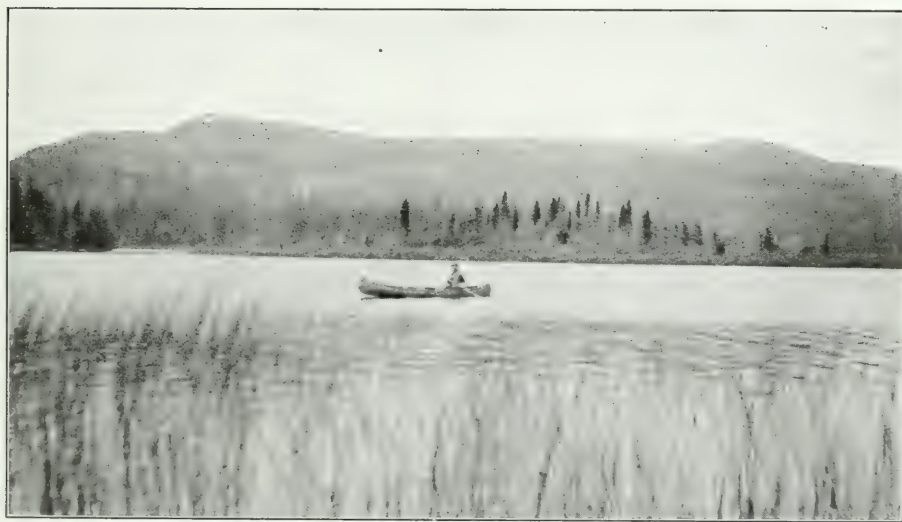
In the fresher samples of fine-grained greenstone a basaltic texture can be observed showing rods of plagioclase set in a groundmass of pyroxene or hornblende, which is generally altered to chlorite.

What is believed to be the spherulitic structure in greenstone was observed on the north shore of Doig lake in the north part of Lebel township. This structure is indicated by small raised and rounded masses which are lighter in color than the surrounding rock. Some of these are over an inch in diameter. They differ quite distinctly from the ordinary quartz and calcite amygdules so frequently observed. They are grouped quite thickly along the ellipsoids of the greenstone.

The broad areas of massive greenish basalt are not likely to be of much economic importance, but where shear zones occur, and the rocks have been rendered schistose, impregnated with secondary solutions and intruded by light-colored rocks, they are worthy of prospecting for gold-bearing veins.



Scene on Blanche river, McElroy township, showing rocky bluff on right, 150 feet high



Scene on Amikougami lake. Hill of Keewatin basalt in back ground, rising to 460 feet above lake level.



The chemical composition of certain Keewatin rocks is shown in the following table. They are typical rocks from Amikougami lake.

	1. Per cent.	2. Per cent.
Silica . . . . .	48.70	53.90
Alumina . . . . .	15.21	19.67
Ferrous oxide . . . . .	8.35	10.21
Ferric oxide . . . . .	4.28	0.71
Lime . . . . .	11.11	8.30
Magnesia . . . . .	3.76	0.72
Soda . . . . .	3.23	2.78
Potash . . . . .	0.59	0.58
Carbon dioxide . . . . .	2.25	0.86
Water . . . . .	0.65	1.80
Manganous oxide . . . . .	.....	0.32

1. Ellipsoidal greenstone (basalt) 15 chains west of III mile post, north line of Teck township.

2. Amygdaloidal greenstone (basalt), Amikougami lake, 15 chains north of III mile post, north line of Teck township. This rock also shows an ellipsoidal structure.

#### Keewatin Diabase

Diabase, occurring as dikes and broad masses, intrudes the fine-grained greenstone at many places. This rock is generally less fresh-looking than the Nipissing diabase of Cobalt, but occasionally is mistaken for this much younger basic rock. It is often light green in color and coarse in grain like gabbro, while the original constituents are usually altered to secondary minerals. There is a large volume of this rock around Amikougami lake and throughout the Keewatin areas in the north part of Teck and Lebel. Some dikes of diabase are also seen on Otto lake. The rock is pre-Timiskaming in age, since an unconformity was observed on mining claim L. 1824 on the south shore of the northwest bay of Kirkland lake. Fragments of the diabase were found as pebbles in the Timiskaming conglomerate that rests on the diabase.

#### Feldspar-porphyry

A grey feldspar-porphyry to the east of Murdock creek in Teck township has been placed in the Keewatin. This rock has been described by Mr. E. L. Bruce as follows: "The feldspar phenocrysts show distinctly on the surface. Under the microscope the rock is distinctly porphyritic. The phenocrysts are plagioclase feldspar near the albite end, set in a groundmass of quartz, feldspar and hornblende. Considerable alteration has taken place, producing chlorite, sericite, kaolin, carbonates and epidote. Magnetite and chalcopyrite are present. The phenocrysts make up a large part of the rock, the areas of groundmass being narrow.

"An analysis of this rock gave: Silica, 60.71; alumina, 14.87; ferric oxide, 3.26; ferrous oxide, 3.60; magnesia, 3.52; lime, 3.29; potash, 2.52; soda, 4.40; carbon dioxide, 1.68; water, 2.35.

"This calculates to a norm consisting of: Quartz, 17.34; orthoclase, 11.10; albite, 37.16; anorthite, 1.67; magnetite, 1.20; chlorite, 12.93; kaolin, 4.82; sericite, 3.14; hornblende, 7.70.

"This shows the acidic nature of the feldspar. The large quantity of chlorite present explains the rather high percentage of water in the analysis."

This rock was not observed in contact with the Timiskaming series. It may possibly be later than the Timiskaming, but, owing to its rather schistose character, it is placed with the Keewatin tentatively.

The conglomerate of the Timiskaming series contains numerous pebbles of feldspar-porphyry, derived from pre-existing rocks of Keewatin or Laurentian age. These porphyries were therefore much older than those in the vicinity of Kirkland lake, which are younger than the rocks of the Timiskaming series.





Ellipsoidal greenstone, Amikougami lake.



Unconformity between conglomerate of the Timiskaming series and Keewatin diabase Claim L 1824 Kirkland lake.

#### Quartz-feldspar porphyry

There are some outcrops of quartz-feldspar porphyry (granite porphyry) which have been grouped with the Keewatin. This porphyry occurs chiefly around Goodfish lake and to the south of this lake. The rock has a grey color and a whitish weathering surface in which quartz phenocrysts are quite conspicuous. The porphyry intrudes the greenstone, but is older than the Timiskaming conglomerate, since there are pebbles of the porphyry in the conglomerate on the north shore of Gami lake. This conglomerate is isolated from the main area of Timiskaming rocks but is considered to be part of the series. The porphyry is somewhat schistose, like other members of the Keewatin, and is similar to certain porphyries described in the Porcupine gold area. It is an older rock than the reddish and greyish feldspar-porphyry found near the Tough-Oakes mine. Under the microscope the phenocrysts of quartz are much corroded, with rounded angles, while the feldspar is a plagioclase near the albite end of the series. The feldspar phenocrysts are greatly in excess of the quartz. The ground-mass is quite felsitic. South of Gami lake the porphyry is much darker and finer-grained than to the north, but small eyes of clear dark-colored quartz aid in recognizing the rock.

#### Dolomite

Ferruginous dolomite occurs in narrow bands in different parts of the Keewatin areas. This rock is quite prominent in the southeast part of Gauthier township, where several pits and shafts have been sunk in prospecting for gold. A striking occurrence of the dolomite can be seen on mining claim L. 1065 on the north side of the Dane-Larder lake road. The rock in places is greatly intersected by quartz and carbonate veinlets and contains the bright green chrome mica (fuchsite).

#### Iron formation

Members of the iron formation occur in isolated parts of the area. At points along the railway, between Swastika and the granite area south of Boston creek, there are bands of iron formation, represented chiefly by black slaty or cherty members, in which there is iron pyrites, the oxidation of which has greatly discolored the formation. One of these occurrences is just east of mileage 162. The most important iron formation in the area is to the north of the Dane-Larder lake road in the township of Boston. This iron range, which consists of interbanded silica and magnetite, has been little developed, but a number of pits have been sunk upon it. It has been described by W. G. Miller and W. A. Parks. The bands have been traced over several miles, in the north part of the township, by means of isolated exposures. At one time the formation covered a large area, but was infolded with the underlying greenstone and then eroded. The exposures now consist of narrow, approximately vertical bands. This iron formation was staked several years ago. It was later restaked as gold prospects. The iron bands have been broken up, and quartz veins have been formed, and in some of these gold has been found. At other places, as on H. R. 1401 (Dane Copper Mining Company), the iron formation has been impregnated sufficiently with copper pyrites to be worked as a copper prospect and some tons of copper ore have been shipped.

## TIMISKAMING SERIES

A series of sedimentary rocks was laid down on the eroded surface of the Keewatin complex. These rocks have been infolded with the Keewatin and eroded so that the series has now a highly inclined attitude. The strike of the inclined strata is in a general east and west direction while a schistosity has been developed in a northeast and southwest direction. The greatest development of this series is in the townships of Teck and Lebel, and probably represents a syncline. Owing to the amount of drift and the many intrusions of dikes into the series, it is difficult to determine whether



Conglomerate of the Timiskaming series which has been rendered highly schistose. North of O'Connell lake, Lebel township.

the structure is a syncline or not. The lower formations have been largely altered to schist, but conglomerate, slate and greywacké, with some cherty iron formation can be recognized at places along the north and south boundaries of the series. The rocks toward the central part are more readily recognizable, being represented chiefly by boulder conglomerate with bands of greywacké and quartzite. The series can be traced easterly, with less conglomerate and more of the fine-grained schistose types outcropping, to the Larder lake area. In the Kirkland lake area, several unconformities



were found. The Timiskaming series was laid down on an eroded surface of the Keewatin, the overlying conglomerate containing fragments of the greenstone (basalt), old diabase, and altered quartz feldspar-porphyry of the Keewatin. These unconformities can be seen on mining locations: L. 2796 in the northwest part of Lebel township; L. 1824 (H. S. 1199) on the south shore of the northwest bay of Kirkland lake; and on the north shore of Gami lake. The greatest width of the series of nearly three miles is along the boundary line between Teck and Lebel.

Like the Keewatin, the Timiskaming series has been impregnated with carbonate solutions. A rock which has been altered to ferruginous carbonate outcrops about nine chains north of O'Connell lake. Some of the conglomerate bands have been compressed into schist as shown to the northeast of O'Connell lake. At other places where the pebbles are of hard porphyry, chert and other material the matrix has been rendered schistose and the pebbles are readily separated from the matrix. A conglomerate of this character occurs to the north of Gull lake on L. 2452. Isolated patches of the Timiskaming series which have escaped erosion outcrop at points along the Dane-Larder lake road.

The series is well exposed along the railway track west from Swastika to Kenogami. South of Kenogami station the beds of conglomerate and greywacké are almost vertical, while just west of the station rocks of the Cobalt series are in almost undisturbed position.

#### Sections of Greywacke

A microscopical examination was made of greywacké from the vicinity of the Tough-Oakes mine, just south of No. 3 vein, near the Teck-Lebel line. The greywacké is composed of angular fragments of quartz, orthoclase, plagioclase, chlorite, and other minerals, with considerable carbonate scattered through it. The rock is quite readily recognized as of sedimentary origin. A rock from the original shaft of the Burnside is similar to this. The impregnation of the rocks by much carbonate or sericite aids in distinguishing them from greywackés of the Cobalt series.

#### Variety of Pebbles in the Conglomerate

There is a great variety of pebbles in the conglomerate, including various greenstones, diabase, porphyries, felsite, an occasional granite and numerous fragments of iron formation. Some of the fragments of iron formation are of a bright, red jasper, which gives the rock a very striking appearance. There are also pebbles of quartz with pyrite from an older series of veins than the Kirkland lake gold-bearing veins.

The sedimentary rocks shown in Gauthier township extend into McVittie township. The slate and associated rocks are mapped by Mr. M. E. Wilson with the Keewatin, and the conglomerate with the Huronian. The conglomerate that outcrops at Larder Lake village, and which is intruded by lamprophyre, is similar to that at Kirkland lake, and for purposes of correlation may be called "Timiskaming." The similarity of the conglomerate at Larder lake to the Timiskaming series at Cobalt has been referred to by Mr. M. E. Wilson.<sup>1</sup>

It is possible that there may be an unconformity in the series which is mapped as Timiskaming, i.e., the lower portion, consisting largely of slate, glossy schist, and carbonate rock, may have been eroded before the deposition of the upper, largely conglomerate portion of the series. There is a concordance in the strike of the sediments, and no unconformities were observed; hence all these sediments were mapped as one series.

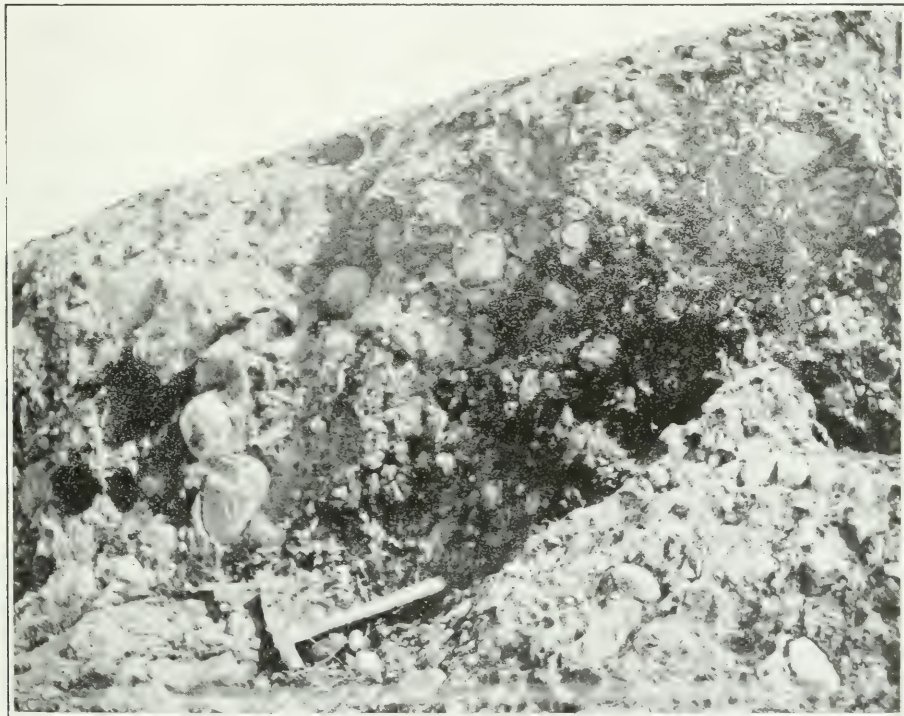
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<sup>1</sup> Memoir No. 17-E, Geological Survey, Canada, p. 38.





Timiskaming series, exposed on the Dane-Larder lake road.



Conglomerate of the Timiskaming series. Half mile north of Gu.I lake, Lebel township.  
2 M. (P. II)

## POST-TIMISKAMING INTRUSIVES

## Lamprophyre

Dikes of lamprophyre are common in the Keewatin and Timiskaming. In the Keewatin the dikes are usually quite narrow, some of them being only ten or fifteen feet wide. The cuttings along the railroad from Swastika to Boston creek reveal many lamprophyre dikes. Just east of Amikougami creek there is a mica-lamprophyre, quite black in color. Immediately south of Boston creek bridge there is a reddish lamprophyre (minette), which shows glistening biotite in hand specimens. Under the microscope biotite and hornblende are seen to be abundant. Chlorite, with needles of rutile, an alteration from the mica, is common. There are a few porphyritic feldspars, and microcline is abundant. Quartz in small grains is present. Sphene, apatite and magnetite are accessory minerals. Lamprophyre intrudes the Timiskaming series in some volume, as shown on the accompanying map. In the large area in northwest Lebel there is a reddish rock which appears to be a differentiation from the normal black lamprophyre. Often there is a ribbed structure in the rock, due to very narrow dikes, an inch or so in width, which intersect the lamprophyre. These dikes may fill cooling cracks since they were not observed extending into any of the adjacent rocks. A pitted surface, due to the leaching of the ferro-magnesian mineral, is another marked character of the lamprophyre. A schistose structure is also often developed. This rock is the oldest of the intrusives into the Timiskaming series.

Mr. E. L. Bruce has described an augite-lamprophyre from the north shore of the Blanche river in Eby township. Numerous phenocrysts of augite are set in a ground-mass made up of needle-like feldspar and smaller augite crystals.

There is a somewhat similar lamprophyre on mining claim L. 2445 in northwest Lebel. The phenocrysts of augite are altering to hornblende. Lamprophyre is well exposed just south of the mill at the Tough-Oakes mine.

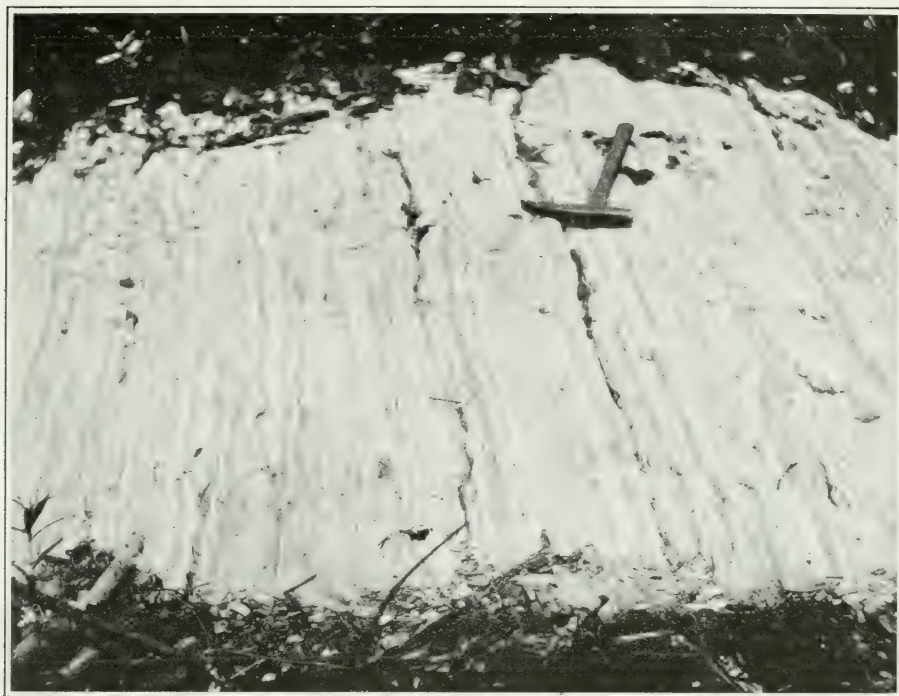
## Analyses of Lamprophyre

	1.	2.
	Per cent.	Per cent.
Silica . . . . .	48.50	52.29
Alumina . . . . .	22.43	19.38
Ferrie oxide . . . . .	2.85	4.40
Ferrous oxide . . . . .	4.78	6.00
Lime . . . . .	7.62	7.79
Magnesia . . . . .	1.16	3.54
Potash . . . . .	3.56	4.12
Soda . . . . .	3.38	2.12
Carbon dioxide . . . . .	3.72	....
Water . . . . .	2.26	.95

1. Lamprophyre from Wishman claim, N.E. of Kirkland lake.
2. Lamprophyre, north of main Blanche river, Eby township. Analyst, E. L. Bruce.

## Syenite

Two large batholiths of syenite are shown on the map. Of these the syenite in Otto township has a predominant reddish color, while that in Boston and Lebel is generally greyish. The rocks of both areas are usually quite massive in structure, except along the margins of the older rocks, where a gneissoid structure is sometimes developed. Tongues of syenite intrude the greenstone.



Iron formation of the Timiskaming series, north of Mud lake, Lebel township.

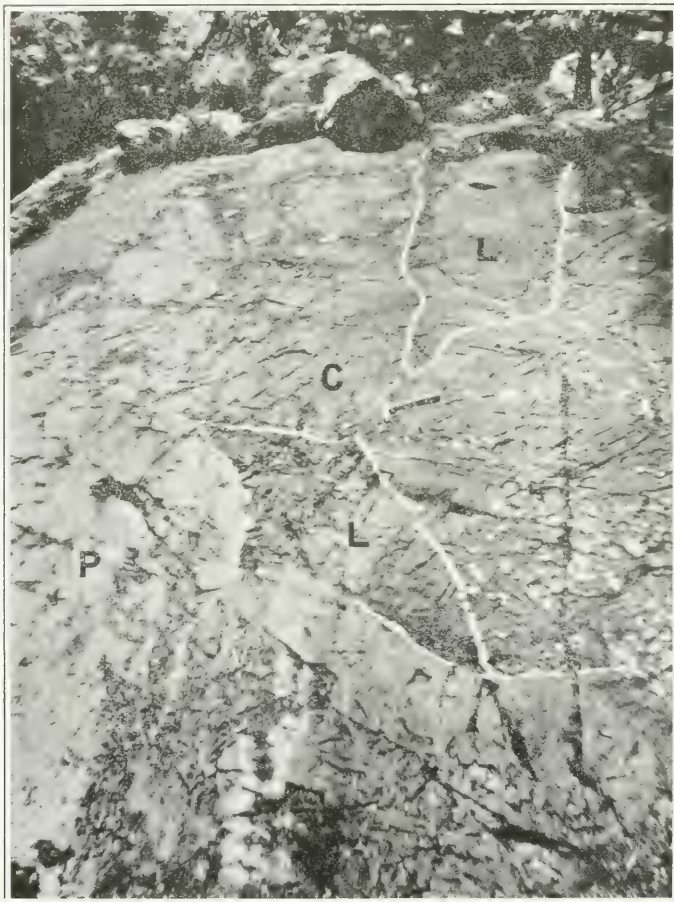


Lamprophyre dike on Wishman claim to the N.W. of the Tough-Oakes mine.



An examination of a syenite from concessions IV and V, Otto township, by Mr. E. L. Bruce showed that the prominent feldspar is a plagioclase near the albite end of the series. Other constituents are orthoclase, quartz, biotite, hornblende and pyroxene. An analysis of the syenite by Mr. Bruce gave the following results: Silica, 61.65; alumina, 18.91; ferric oxide, 2.37; ferrous oxide, 1.48; magnesia, 1.11; lime, 2.10; potash, 4.20; soda, 5.59; water, 0.60.

A quartz-hornblende syenite, from the south boundary of Otto near the half-mile post between lots 9 and 10, consists largely of albite, microcline and micropertthite, with smaller amounts of hornblende, chlorite, quartz, apatite, and intergrowths of quartz and feldspar.



Conglomerate (C) of the Timiskaming series which has been intruded by lamprophyre (L). At a later period both rocks have been intruded by feldspar-porphphyry (P). Claim L. 2491, Teck township.

#### Granite

Around Winnie's lake, in the northwest part of the area, there is a mass of coarse, reddish, hornblende granite. This rock evidently changes to a syenite when followed to the northwest into Maisonneville township. Under the microscope the granite from east of this lake shows numerous large crystals of albite (with zonal structure), and some quartz and hornblende set in a matrix of quartz, orthoclase and albite with smaller amounts of chlorite, apatite and magnetite.



## Feldspar-Porphyry

An intrusive rock, of an acid or intermediate composition, very prominent in the Kirkland lake area, is a reddish or greyish porphyritic rock containing phenocrysts of feldspar (albite). The predominating color of the porphyry is red, often of a deep rich color. In parts of the area this rock is in quite large volume, as around the east end of the southeast bay of Kirkland lake, extending northeasterly to the Tough-Oakes mine and being about a claim in width. Then, again, the porphyry may occur as narrow dikes only a few feet wide and too small to map. Such dikes can be observed along the south shore of Kirkland lake. The fractures in the older rocks strike in a general northeast and southwest direction and conform to the general schistosity of the country. The dikes and masses of porphyry for a great part also extend in this direction. The intrusions of feldspar-porphyry are not so abundant in the Keewatin as in the Timiskaming, probably because the conglomerate and greywacké were more readily fractured than the tough Keewatin greenstone. The porphyry varies considerably in texture, from a coarse rock with readily recognizable phenocrysts to a fine-grained, felsitic rock requiring a microscopic examination to reveal the feldspar phenocrysts. In the coarser phases the phenocrysts average 1-16 to 1-8 inch. They vary in color from a deep red to almost white. Occasionally eyes of clear quartz occur in the porphyry. Scattered blades of biotite, some of which are altered to chlorite, are often recognized in hand specimens. Microscopically the feldspar phenocrysts often exhibit a beautiful zonal structure. Zones of sericitic material are frequently recognized in the phenocrysts, probably the result of alteration of some intergrown orthoclase. There are a few scattered crystals of quartz, generally smaller than the feldspar phenocrysts, and laths of biotite, some of which show alteration to chlorite. The groundmass is fine-grained, consisting largely of feldspar with some quartz.

Analyses of feldspar-porphyry gave the following results:—

	1.	2.	3.
	Per cent.	Per cent.	Per cent.
Silica . . . . .	66.30	66.48	56.25
Alumina . . . . .	15.37	15.42	18.42
Ferrie oxide . . . . .	0.37	1.05	1.56
Ferrous oxide . . . . .	1.47	1.18	7.41
Lime . . . . .	3.06	3.15	6.13
Magnesia . . . . .	1.16	1.67	2.38
Potash . . . . .	3.86	2.56	0.32
Soda . . . . .	4.78	5.97	8.10
Carbon dioxide . . . . .	3.34	2.65	4.58
Water . . . . .	0.60	0.30	0.22

1. Tough-Oakes, near No. 1 vein.
2. Teck-Hughes, near vein east of No. 1 shaft.
3. Cut west of Swastika station.

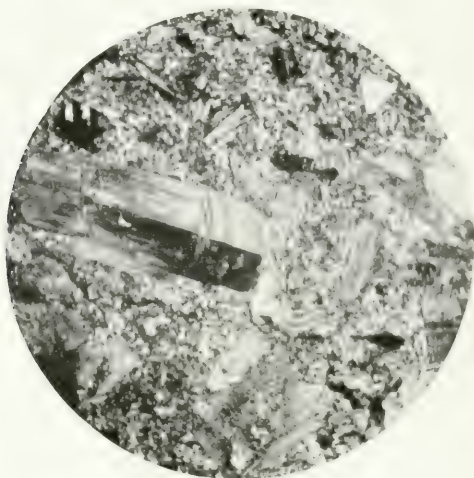
Nos. 1 and 2 analyses are very similar, while No. 3 is quite high in soda, indicating a rock composed chiefly of albite, which may be called an albite porphyry. The analysis of No. 3 was made by Mr. E. L. Bruce, whose comments are given in his report on "The Swastika Gold Area."<sup>1</sup>

The name "feldspar-porphyry" has been used for this reddish or greyish porphyritic rock rather than the name "porphyrite" or "diorite porphyrite." Phenocrysts of albite are prominent in the rock, while other acidic feldspars are also present. The ferro-magnesian minerals occur only in minor quantity. In some phases of the rock the abundance of albite suggests the term "albite porphyry." MacLaren<sup>2</sup> uses the term "albite porphyry" or "feldspar porphyry" to describe a dike rock which is associated with the gold deposits of Kalgoorlie, West Australia. The albite porphyry

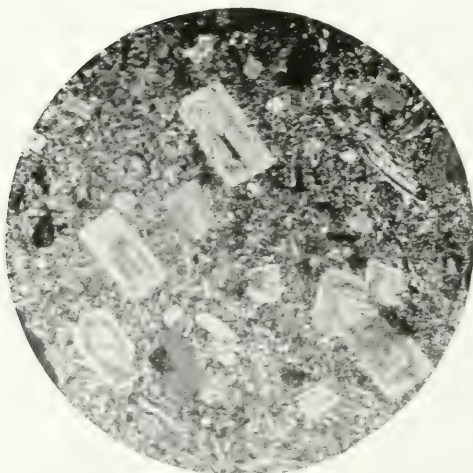
<sup>1</sup> 21st Annual Report, Bureau of Mines, Ont., 1912, p. 262.

<sup>2</sup> *Geology of the Kalgoorlie Goldfield*, Mining and Scientific Press, 1913, Vol. 107, p. 97.

of Kalgoorlie is characterized by the presence of notably large, well-shaped crystals of feldspar, but does not contain the hornblende or biotite that are found in the porphyrites which are described by MacLaren as ranging from dark grey to bluish rocks like diorite to light porphyritic rocks distinguishable with difficulty from feldspar-porphyry.



Photomicrograph of reddish feldspar-porphyry, from north part of Burnside claim, L. 1823. X 19 diameters.



Photomicrograph of greenish feldspar-porphyry from wall of gold bearing vein on Burnside claim, L. 1823. The rock contains considerable sericite. X 19 diameters.

## COBALT SERIES

There is only one small area of conglomerate, that in the southeast part of Grenfell township. This conglomerate extends westerly to Kenogami lake, where it is well exposed. Just northwest of Kenogami station there is a prominent hill about 110 feet in height, where conglomerate unconformably overlies Keewatin ellipsoidal greenstone. The conglomerate contains numerous boulders of syenite and granite and is very little



Scene on Kirkland lake.

disturbed, whereas only a few hundred feet to the south the Timiskaming series has been greatly folded, the strata being in almost vertical attitude. The two series were not observed in contact.

## DIABASE

There are a few dikes of fresh diabase which is the most recent rock in the area. A dike of red feldspar-porphyry has been intruded by a dike of diabase on the Hunton claim south of Kirkland lake.



View of Blanche river, Otto lake and Swastika mine from T. & N. O. Railway.



### Origin and Age of Gold Deposits

All the gold deposits of northern Ontario are in the pre-Cambrian, in rocks which, with few exceptions, are older than the Cobalt series. After the folding of the Timiskaming series and before the deposition of the Cobalt series, there was a period of igneous activity during which basic and acid rocks, including lamprophyre, porphyry, syenite and granite, were intruded into the older rocks. The lamprophyre is distinctly older than the other intrusives and has no bearing on the ore deposition. The probable genetic relationship of the gold deposits of Porcupine to granite intrusions has been noted in a report on that area. There are a number of gold-bearing veins at Kirkland lake, along the contact of intrusive feldspar-porphyry and older rocks, suggestive of a relationship between the intrusive and the veins. There are areas of granite and syenite within a short distance of the gold deposits. An examination of a number of specimens from these plutonic areas shows that these rocks contain albite, usually as phenocrysts, similar to the feldspar-porphyry. It is quite likely that the granite, syenite and feldspar-porphyry belong to the same period of intrusion and are different facies of a plutonic rock which underlies the whole area. The syenite and granite have been exposed by deep erosion.

While the gold-bearing veins were formed subsequent to the intrusion of the porphyry, it is likely that they are genetically connected with the intrusive rock which occurs as dikes and boss-like masses. The cooling of the intrusive was apparently accompanied by shrinkage, faulting and displacement in the porphyry itself and in the adjacent rocks. The gold-bearing, silicious solutions that deposited their burdens in the fissures and other fractures in all probability represented the end product of the intrusion of the acid rocks that have been mentioned.

Lindgren<sup>1</sup> in his classification of mineral deposits places the gold-quartz veins of Ontario in the division of "veins and replacement deposits formed at high temperature and pressure and in genetic connection with intrusive rocks." He says: "These veins are clearly related to those of the southern Appalachian states, but, on the other hand, they present some remarkable analogies with those of California." The veins of Kirkland lake, which are somewhat unlike those in other parts of the Province, had not been discovered prior to the publication of Lindgren's description. These veins were formed at considerable depth and have been exposed by extensive erosion, but it is probable that they were not formed at as high temperatures as the veins at Porcupine, in which tourmaline and pyrrhotite frequently occur. The minerals tourmaline, pyroxene, garnet, amphibole and biotite, characteristic of deposits formed at high temperatures, have not been recognized by the writers in the Kirkland Lake area. Albite, chlorite, sericite and carbonates are present in the deposits as alteration products. The veins at Kirkland lake in their mineral constituents greatly resemble those of the Sierra Nevada, California, which are described by Lindgren.<sup>2</sup> In these latter veins tellurides like altaite, hessite, calaverite, petzite and melonite are frequently associated with native gold.

In a comparison of the Cripple Creek and Kalgoorlie gold deposits, Lindgren has shown that telluride of gold may be deposited in large quantities both near the surface (as at Cripple Creek), and at a depth of many thousands of feet below it (as at Kalgoorlie).<sup>3</sup> Telluride of gold is not so abundant in the Kirkland lake deposits as telluride of lead, but probably occurs in greater quantity than has been suspected owing to the difficulty of identifying the telluride in fine grains when accompanied by native gold. As stated above, the mineral associations at Kirkland lake are not typically those of high temperature deposits. Magnetite has been found in gold-bearing veins at the Huronian mine, a few miles east of Kirkland lake, and specularite has

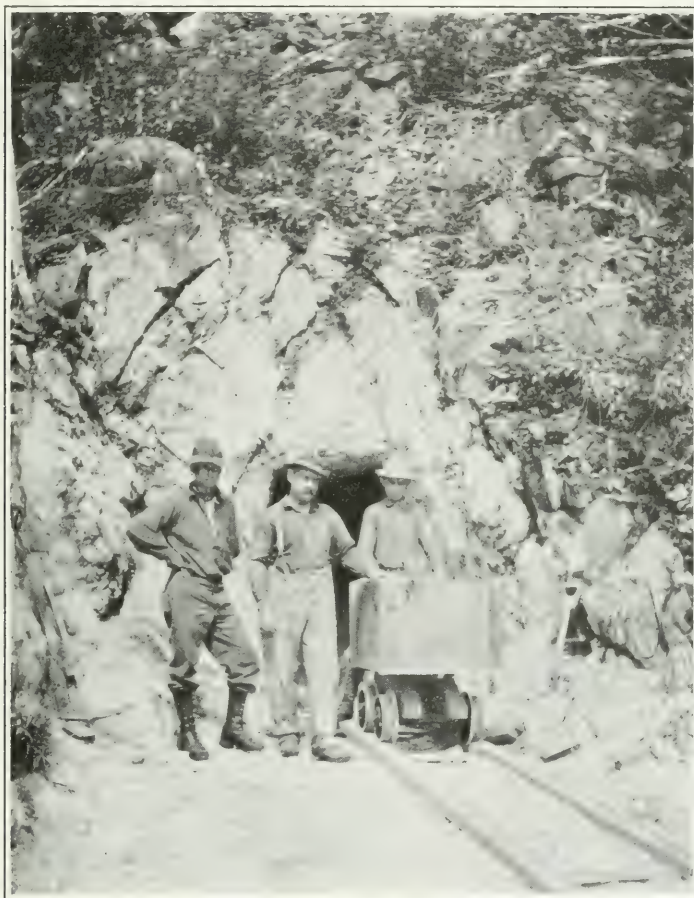
<sup>1</sup> Mineral Deposits, W. Lindgren, p. 635.    <sup>2</sup> Ibid, p. 530.

<sup>3</sup> Economic Geology, 1905-6, Vol. 1, 542. "Metasomatic Processes in the Gold Deposits of Western Australia."



been reported in veins from the Tough-Oakes mine. The Kirkland lake deposits have probably been formed at considerable depth, like the Kalgoorlie deposits, but not at such high temperatures, while the mineral association is somewhat similar in that native gold accompanies the tellurides.

The physical characters of the veins at Swastika and Kirkland lake are somewhat different. At Swastika the veins are generally several feet in width and are composed



Prospecting on the Blanche river in the south part of McElroy township

chiefly of white quartz with a few fracture planes, whereas at Kirkland lake the veins are quite narrow, often extremely brecciated and impregnated with secondary material, the quartz sometimes forming only a small portion of the ore body.

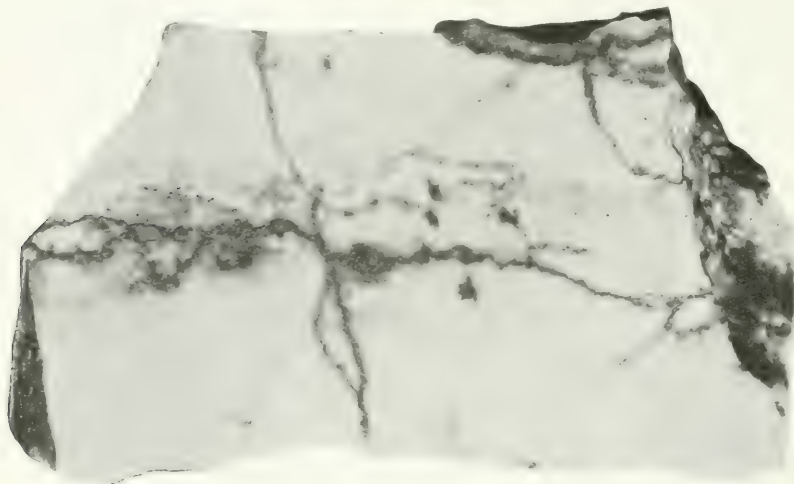
The productive veins at Swastika are in the altered Keewatin greenstone, while no veins of economic importance have been found in the conglomerate, although the rock is intruded by the feldspar-porphry. There is no apparent reason why the conglomerate at Swastika should not carry gold-bearing veins as at Kirkland lake. The

same may be said of the feldspar-porphyry at Swastika which has not been proved to contain economic gold-bearing veins, though this rock at Kirkland lake shows some promising veins. The veins at Swastika in their general character, width of quartz, lenticular form, and other features, resemble the veins in the Porcupine area.

Tellurides have not been reported in the veins at Swastika, but molybdenite, of such frequent occurrence in the Kirkland lake area, has been found in several veins at the Lucky Cross mine.

### The Swastika Area

The first development work in the areas described in this report was done near Swastika village, where mining operations were carried on at the Swastika and Lucky Cross properties. These mines are equipped with power plants and small stamp mills, and some bullion has been produced, but at the present time both properties are closed down. The ore deposits consist of quartz veins, sometimes five to seven feet wide.



Gold-bearing quartz showing the brecciation of the primary quartz and the deposition of pyrite and gold along fracture lines, Swastika mine.

Development has shown that the values occur in shoots in the veins. There are often streaks of dark-colored mineral, roughly parallel with the walls of the vein, along which gold is more abundant than in the white quartz. A polished surface of ore from No. 1 vein of the Swastika mine shows white quartz with dark streaks along which the quartz has been greatly fractured. Along these lines of weakness there has been a concentration of gold and iron pyrites, in places showing rather continuously. In the crushed portions of the quartz there are small clusters of particles of iron pyrites and gold. High values frequently occur along the junction of the quartz with the schist. Minute veinlets of clear quartz up to  $\frac{1}{4}$ -inch in width cut the vein quartz and are later than the gold. Calcite and other carbonates are sometimes present in the veins. The best veins occur in the greenstone near the contact with feldspar-porphyry, while the veins in the light-colored intrusive rock have not been found promising in the Swastika area.

### Kirkland Lake Area

Prospecting has shown a promising area, extending in a general N.E. and S.W. direction, from about half a mile southwest of the southwest bay of Kirkland lake to the vicinity of the Teck-Lebel boundary line. In this area a number of gold-bearing veins have been discovered in the conglomerate and porphyry, there being no outcrops of Keewatin rocks. Further prospecting may show that this gold-bearing area extends beyond the boundaries mentioned above, since the same character of rocks and igneous intrusions occur for some miles on the strike of the Timiskaming series. The schistose older rocks, like the conglomerate and greywacké, have a general N.E. and S.W. strike, which is also the direction followed by the porphyry dikes and other intrusions. The strike of the majority of the veins is also in the same direction.

Gold-bearing veins have been found to the north of this area in Keewatin rocks, namely, in the southwest part of Morrisette township and near the boundary line between Teck and Lebel in the vicinity of Gami lake.

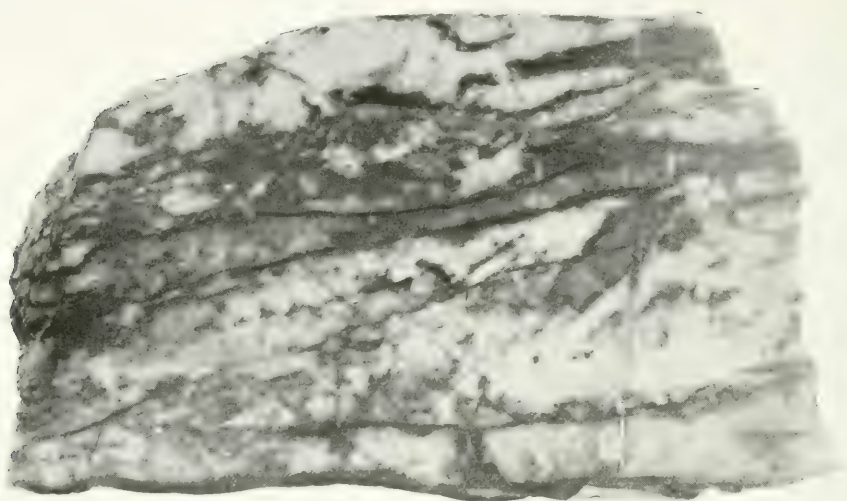
Veins occur not only in the rocks adjacent to the porphyry but also in the porphyry itself, and several veins have been found which pass from the conglomerate into the porphyry. The schistose conglomerate is more likely to contain a well defined, though narrow vein, than the porphyry. In the latter rock there is often a series of quartz stringers and narrow quartz lenses formed along the strike of a fractured zone, producing an ore deposit of a stockwork or stringer lode type, in which numerous quartz veinlets intersect the porphyry. A main fissuring in the conglomerate may also be accompanied by subordinate fissuring, producing somewhat similar deposits. The veins in the conglomerate are generally parallel to the schistose structure, but sometimes they cross the schist for short distances, producing an irregular strike, as can be seen in No. 3 vein of the Tough-Oakes, where it occurs in the conglomerate and greywacké. The dip of the vein may also follow that of the inclined sediments. In part of No. 2 vein of the Tough-Oakes mine, on the east drift at the 100-foot level, the hanging wall is conglomerate and the foot wall is greywacké. A roughly banded structure is sometimes shown in the veins, due to shear planes being developed in the earlier vein filling.

The high-grade ore occurs in the narrow veins, while there may be a lower-grade ore in the wall rock along the veins, so that several feet of ore can sometimes be mined. Development has not proceeded sufficiently far to determine the nature of the ore shoots in the veins as to their length, pitch, relation to contact, and other characteristics.

### Minerals in Kirkland Lake Veins

The oldest mineral in the veins is a coarsely crystalline quartz. Usually this quartz has been broken up and other minerals deposited in the fracture planes. Of these there is quartz, often of a somewhat darker color than that first deposited. Carbonates of various composition are present in the veins. A pink carbonate, on analysis, proved to be calcite with 5.34 per cent. of magnesium carbonate; a grey variety is ankerite. There have been different periods of fracturing. Some of the quartz is later than the carbonates. Where there have been inclusions of country rock in the vein and replacement, some sericite has been developed. Chlorite also occurs as a vein material. Iron pyrites is the most abundant of the sulphides, being found both in the wall rock and in the veins, usually in well crystallized forms. Some of the pyrites in the vein is in fine grains. Copper pyrites occurs to some extent, generally where the vein is gold-bearing. Galena and zinc blende occur in very small quantity. The latter material has been observed in small encrustation veinlets, which are later than the ore. Molybdenite has been deposited abundantly in fractures, usually as a thin film. Gold-bearing solutions have circulated along these planes, and the veins have been enriched by the deposition of gold in these later fractures. Later movements have often slickensided these planes, while the gold, altaite and other minerals may be polished. In some cases the gold has been deposited after the slickensides have been formed, since veinlets of the metal have been observed on the 200-foot level of the Tough-Oakes mine, cutting across the smooth planes of the molybdenite.





Gold-bearing ore from vein No. 2 in the conglomerate, Tough Oakes mine. Specimen shows the repeated fracturing to which the vein has been subjected.

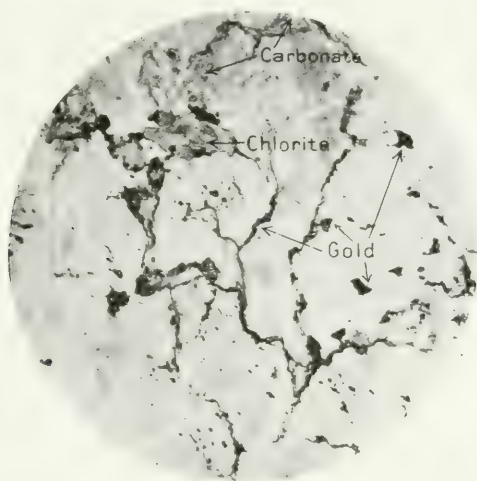


Gold-bearing ore from vein No. 2 in the conglomerate, Tough-Oakes mine. The original quartz filling of the vein has been greatly brecciated.



## Tellurides and Gold

There are several tellurides in the ore. Of these altaite, telluride of lead, has been observed in a number of veins somewhat abundantly. It is best recognized by its well developed cubical cleavage and brilliant cleavage faces. It is often accompanied by visible gold. Tests made by Mr. W. K. McNeill, Provincial Assayer, have shown that both molybdenite and altaite will precipitate gold from chloride solution. Messrs. Campbell and Deyell, of Cobalt, have reported the presence of tetradymite (telluride of bismuth) and hessite (telluride of silver) in ore from No. 2 vein of the Tough-Oakes mine. Several tests have been made at the provincial assay office for gold telluride in ore from the Tough-Oakes mine, but the suspected mineral usually proved to be the telluride of lead. However, one telluride which came from the shaft on No. 3 vein has proved to be a gold telluride. The material was very carefully examined for visible gold, and only the massive brittle mineral of a very pale bronze, almost white,



Thin section of gold bearing quartz from vein on Wright-Hargrave. Carbonate, molybdenite, chlorite, telluride (altaite?), gold and other minerals occur in the fracture planes of the quartz.  
X 19 diameters.

color was examined. On assay, it yielded 40.6 per cent. gold. Other specimens yielded a yellow globule of gold before the blowpipe. Theoretically, telluride of gold ( $\text{Au Te}_2$ ) contains 43.7 per cent. gold. Calaverite corresponds closely to the formula for gold telluride, but usually contains low percentages of silver. The mineral which is described above is probably calaverite, but it contains no silver.

The gold occurs for the most part in the native form, much of which is visible to the eye. A mass of coarse gold taken from the mortar box of the stamp mill at the Tough-Oakes mine contains 904.7 parts fine gold and 73.1 parts fine silver.

There are probably some silver-bearing minerals other than hessite which have not been recognized, since the assays of shipments of high-grade ore show a higher proportion of silver than gold, which is not accounted for in the recovery of silver by amalgamation in the stamp mill of the Tough-Oakes mine.

There have been different movements in the veins, resulting in repeated circulation of gold-bearing solutions with deposition of the gold in the fractures. Native gold has been observed in various constituents of the vein, namely, in the glassy white quartz; in the cleavage planes of calcite; in a group of minerals like quartz, albite and carbonates. The gold is usually associated with some of the sulphides, like pyrite, molybdenite and copper pyrites, and tellurides like altaite.

#### Microscopic Examination of Ore

An examination of a number of thin sections of ore from the Kirkland Lake area shows that the vein material has been much brecciated. Fragments of coarsely crystalline white quartz are often surrounded by secondary minerals. Gold has been observed



Thin section of gold-bearing quartz from No. 2 vein,  
Tough-Oakes mine. Quartz has been replaced  
by carbonate. Black spots are native  
gold. X 19 diameters.

in contact with altaite, molybdenite and iron pyrites. In one case an isolated grain of gold incased a grain of telluride. Fragments of greywacké or porphyry are surrounded by vein minerals. One section shows the quartz greatly fractured and an interlacing meshwork of metallic minerals occurs in the fractures. The crystallized calcite frequently contains gold which has followed along the rhombic cleavage planes. Small clusters of dark minerals, sulphides, tellurides and gold, occur throughout the crushed vein material, while similar minerals sometimes concentrate along the margins of included fragments like bits of greywacké or conglomerate. Carbonate veinlets frequently cut through the quartz and included fragments of rock.

## Development

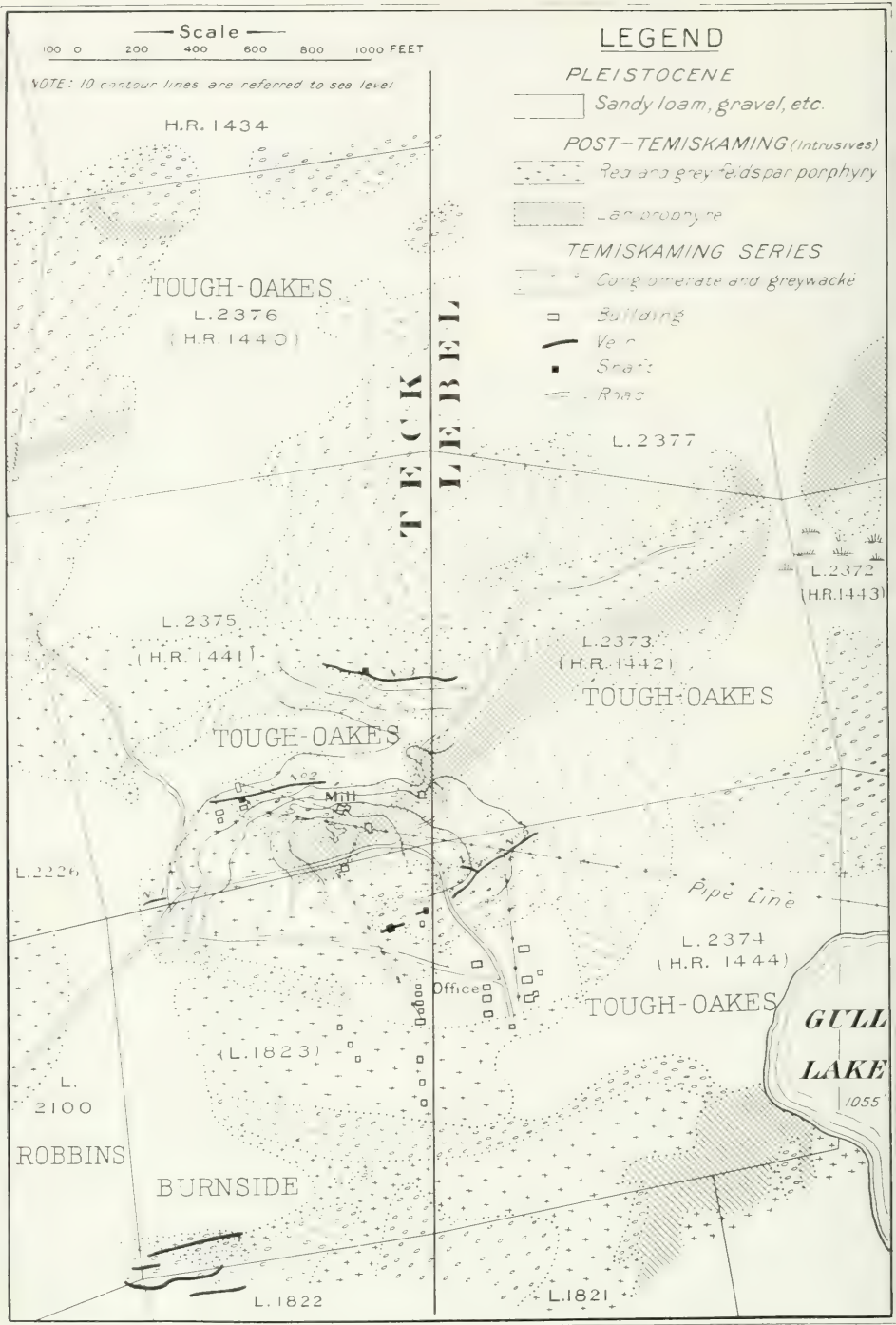
### Tough-Oakes Mines

This property consists of a group of five claims (Nos. H. R. 1440 to 1444), situated along the boundary line between Teck and Lebel townships. Surface prospecting resulted in the discovery of five veins, of which Nos. 2 and 3 were most promising. The greatest development has been on No. 2 vein, which has been traced for 390 feet by means of trenching. The vein is narrow, but showed some extremely high-grade ore on the surface. An open cut was first made on a part of the ore shoot, and from this development two shipments of high-grade ore, which was hand-sorted, were made. The open cut measured 65 feet in length, 7 feet in width and 20 feet in depth. An inclined shaft was then sunk on the vein, which from the surface to the 200-foot level has a dip of about 60° S. At the 100- and 200-foot levels drifts were run to the east and west, following the somewhat irregular strike of the vein. An ore pocket was also constructed at the 100-foot level. The main No. 2 vein, while narrow, is generally very well defined, showing in places a rough banding due to movement. The vein is often greatly brecciated with angular fragments of quartz or country rock in a later cementing material. In the easterly drifts at the two levels the vein is in the conglomerate and greywacké of the Timiskaming series, while in the westerly drifts it crosses the contact into the porphyry a short distance from the shaft. The porphyry has also been encountered in sinking the shaft from the 200- to the 300-foot level, with the vein extending into the porphyry. Development on the vein where it occurs in the porphyry has shown that the high-grade character of the vein filling has extended beyond the contact with the conglomerate. The contact of the conglomerate and porphyry, as revealed in the workings, shows that the porphyry overlies the sedimentary rock at a high angle. Where an open fissure has not been formed, the rock along the fissure plane has been greatly crushed and numerous slip planes have been formed along which gold-bearing solutions have circulated. In these planes quartz, molybdenite, gold and other minerals have been deposited. The formation of the vein fissures was accompanied by faulting, and fragments of wall rock occur in the veins. There are, in addition to the main vein, somewhat parallel stringers of quartz for some feet from the vein, affording workable ore with the included wall rock which is greatly impregnated with secondary material. Some of the vein material from the porphyry on the 200-foot level contains flesh-colored albite in coarsely crystallized masses, giving a pegmatitic structure to some of the vein. Calcite and ankerite occur with the quartz and albite, and grains of gold are disseminated through these minerals. A series of minor thrust faults have displaced No. 2 vein of the Tough-Oakes mine on the 200-foot level. The greatest throw observed is a foot.

A shaft has also been started on No. 3 vein, which is 400 feet north of No. 2. The easterly part of this vein is in the greywacké-conglomerate, and the westerly part in the red feldspar-porphyry, while the dip is to the south, similar to that of No. 2 vein. The shaft was started in the porphyry, while between the two veins, Nos. 2 and 3, is a band of conglomerate which is mostly concealed by drift. The workings from this shaft will be connected by a cross-cut with the 200-foot level workings on No. 2 vein. The cross-cut will prospect ground in the conglomerate that is adjacent to the contact of the intrusive porphyry which lies to the west. No. 3 vein, as exposed on the surface, is in close proximity, over its whole length, to the contact of the conglomerate and porphyry.

Greywacké was encountered in the hanging wall at 70 feet in the shaft on No. 3 vein, while about one-third of the shaft at 90 feet is in the greywacké, the narrow high-grade vein still being in the porphyry. The structure in this shaft is the reverse of that in the shaft on No. 2 vein, where the vein at the surface is in conglomerate, while porphyry came in on the hanging-wall side at depth.

With the exception of the ore from the open cut, the excavation for the ore pockets at the two levels, and the sump on the 200-foot level, the ore raised from the mine has come from development of shaft and drifts.



Plan of the Tough-Oakes and Burnside mines. Mine plans furnished by M. W. Hotchkiss.



The material, as it comes from the mine, is hand-sorted on a bumping-table, and the high-grade ore is bagged for shipment to the smelter. The balance is placed on the dump, from which a part is transported to the mill, where it is treated by crushing in a battery of five 1,050-lb. stamps, and passed over amalgamating plates which catch about 50 per cent. of the head values. The tailing is impounded for future treatment. This treatment is only temporary, pending experiments on the ore, which will suggest the type of mill to be erected.

The power for the mine and mill will be furnished by electric motors driven by power transmitted from a hydro-electric development at Charlton, a distance of twenty-five miles.



Surface plant at No. 2 vein, Tough-Oakes mine.

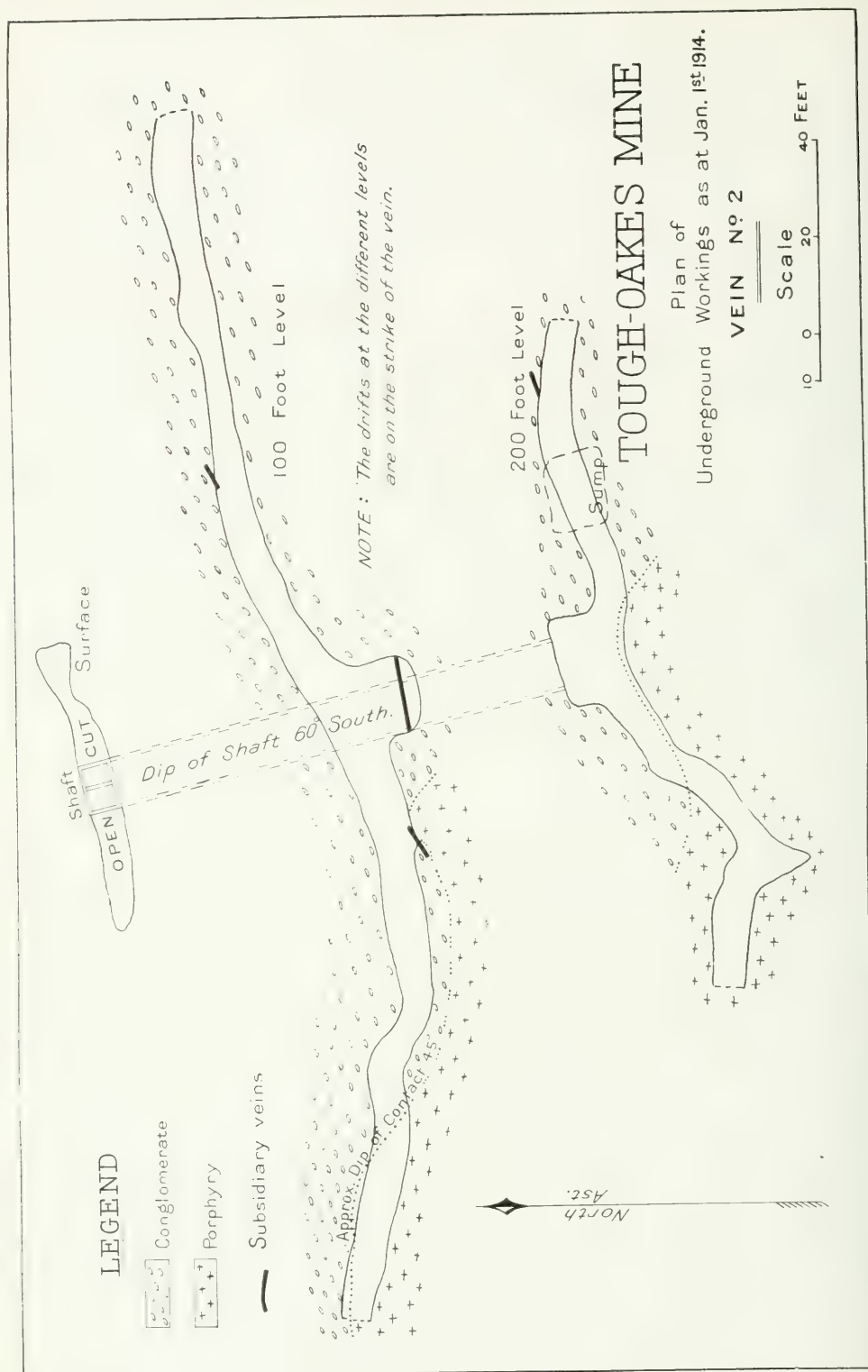
Photo. R. E. HERR.

Up to January 1st, 1914, the following shipments of high-grade ore were made from the Tough-Oakes mine:

Ore shipments	Date	Tons	Silver	Gold	Gross Values
			Oz. per ton	Oz. per ton	
Lot A .....	Sept. 18, 1912.....	1.89	....	17.45	660.37
Lot B .....	Dec. 21, 1912.....	19.90	23.4	22.50	9,235.60
Lot C .....	March 19, 1913.....	20.52	33.66	19.68	8,492.23
Lot D .....	June 5, 1913 .....	30.43	37.90	23.04	13,147.10
Lot E .....	Oct. 30, 1913.....	28.28	64.20	24.07	14,685.90
Total.....		101.04			\$46,221.20

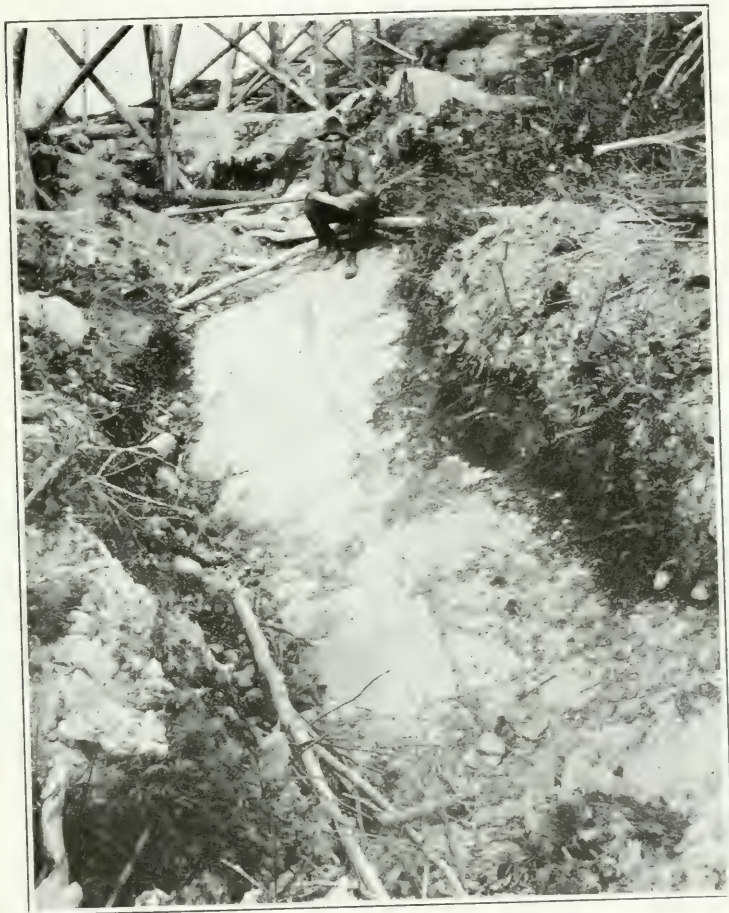
Up to the same date the small mill treated 1,975 tons of ore and with about 50 per cent. recovery produced bullion containing 1,272.44 fine oz. gold and 198.23 fine oz. silver, with a total value of \$26,348.87.

Development consisted of a shaft 208 feet deep, with drifting of 247 feet at the 100-foot level, and 146 feet at the 200-foot level. In addition there is an open cut 65 feet in length and pockets and stations at the two levels.



## Burnside

This property (claims Nos. L. 1821-3) adjoins the principal claim of the Tough-Oakes group on the south. Veins have been discovered near the contact of the porphyry and conglomerate. The principal workings are on the northeast part of claim L. 1823, where veins were exposed by deep trenches. No. 1 shaft was sunk on a vein which showed high-grade ore on the surface. The shaft is vertical, and the vein left the



A narrow part of No. 2 vein in the conglomerate, Tough-Oakes mine.

shaft at 60 feet down; at 80 feet a cross-cut was made N. 30° W. for 110 feet. A vein containing high-grade ore was encountered at 80 feet, which will be drilled on. The ore in the vein, where cut, is similar to that from No. 2 vein of the Tough-Oakes. Several narrow veins were also found in the southwest part of the claim which show high values on assay.

## Teck-Hughes

There has been considerable prospecting accomplished by means of trenching and underground work on this claim, No. L. 1238. No. 1 shaft, at the east side of the property, was sunk vertically 100 feet on a vein in the feldspar-porphyry, and a cross-cut of 23 feet was made to the south to the vein which dipped from the shaft. Drifts were run 70 feet to the east and 30 feet to the west on the vein. The vein is exposed to the northeast of the shaft. At one place there are about two and a half feet of quartz with porphyry inclusions, with an excess of quartz, while on each side there are one and a half feet of porphyry carrying quartz veinlets. The vein matter is lighter colored than that in the veins in the conglomerate.



No. 1 vein, Teck-Hughes, vein occurs in the feldspar-porphyry.

No. 2 shaft was sunk 40 feet on No. 2 vein in the conglomerate, which was traced 200 feet on the surface by trenching. At one point there is a width of 12 inches of vein material, consisting of quartz and altered conglomerate, which has a crushed appearance. The vein contains molybdenite, pyrite, and some visible gold.

No. 3 shaft was sunk in the porphyry to the 75-foot level, and a drift of 163 feet made easterly on a fractured zone containing quartz. Short cross-cuts were made at 50 feet and at 100 feet. A cross-cut was made to the north to intersect vein No. 2, in which there is ore where the vein was cut. At 163 feet in the drift a cross-cut was made to the south, where another fractured zone was encountered and which was being drifted on in March, 1914.



#### Wright-Hargrave

This property, claims Nos. H. R. 709-710, is situated at the east end of the south-east bay of Kirkland lake. The veins occur in the red feldspar-porphyry, and are comparable in structure with veins which are found in the porphyry in other parts of the area. In the north part of the claims there is a promising vein that strikes to the north of east and in which gold and tellurides occur. The vein filling consists of quartz, calcite, and included rock, together with molybdenite, telluride (altaite), pyrite, and other minerals. A shaft has been sunk to a depth of 78 feet, and the vein has been drifted on to the west for 60 feet and to the east for 55 feet.

#### Sylvanite (Wright and Robbins)

When this property, claims Nos. L. 2100-03, 2207, 2226, was visited in January, 1914, shafts were being sunk on two veins. On the Wright claim, No. 1 shaft was down 40 feet in the porphyry, where there is a fracture zone, showing quartz veinlets intersecting the porphyry. No. 2 shaft on the Robbins was down 20 feet, with conditions similar to those on the Wright. Gold could be observed in the vein matter.



Saw mill at Huronian mine, Beaverhouse lake, northeast part of Gauthier township.

#### Oakes

On this claim, L. 1857, a 40-foot shaft has been sunk on an altered part of a porphyry dike, which is somewhat greenish in color, and is intersected by quartz veinlets. Some drifting has been done on this fractured zone. At various places on the surface gold can be seen in the quartz veinlets and in fractures in the porphyry.

Shafts have been sunk on other properties, including the Wettlaufer (L. 16626), Wood (L. 1236), and Hunton (L.16621).

#### Gold in other Townships

*Morrisette township.* On claims L. 2194 and L. 2202 (Costello), visible gold occurs in a zone of rusty carbonate impregnated with quartz. The country rock is amygdaloidal basalt, which is intruded by light-colored quartz porphyry.

*Gauthier township.* Gold-bearing quartz veins have been found in the northeast part of the township, just west of Beaverhouse lake, on claims now operated by La

Mine D'Or Huronia. The quartz veins are narrow, but gold can be observed at a number of places. Magnetite, iron pyrites and copper pyrites were observed in the veins. The country rock is Keewatin greenstone, which is intruded by narrow dikes of reddish porphyry.

### Copper Ore

On a group of claims in Lebel and Teck townships the Dane Mining Company is prospecting for copper ore. Two shafts have been sunk on copper-bearing veins, and some ore has been shipped from the property.



Shaft on quartz vein, carrying copper pyrites. Dane Copper Mining Co., Lebel township.

### Acknowledgments

The writers desire to express their thanks to the men who were in charge of the properties in the Kirkland Lake area when the country was being examined. Thanks are especially given to Messrs. C. A. Foster, Chas. O'Connell and M. W. Hotchkin, of the Tough-Oakes mine, from whom much information relative to the report was obtained. The assays and analyses, unless otherwise stated, were made by Messrs. W. K. McNeill and T. E. Rothwell, of the Provincial Assay office. Mr. W. R. Rogers, topographer, had charge of the production of the accompanying maps. The writers were capably assisted in the field work by the following gentlemen: Mr. R. M. Smith, Kingston; Mr. G. J. Smith, Kingston; Mr. R. W. Young, Bothwell; Mr. A. F. Mahaffy, Cromarty.

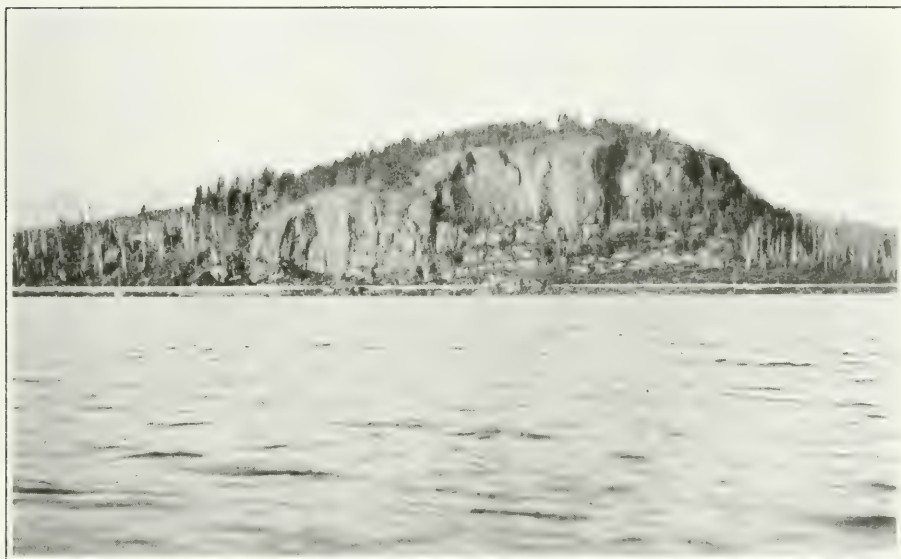
## MAISONVILLE, GRENFELL AND EBY

A geological map of the townships of Maisonville, Grenfell and Eby accompanies the report on the Kirkland lake and Swastika gold areas (Map No. 23b).

The townships lie immediately to the west of the areas previously described. The geology of Maisonville, Grenfell and Eby is very similar to that of the Kirkland Lake and Swastika areas, and has been described in some detail in the marginal notes accompanying the geological map of the townships.

The predominating rocks are of the Keewatin system, consisting of basalt and andesite which have been intruded by diabase, the latter rock sometimes occurring in large volume. There are also some scattered bands of iron formation, particularly in Maisonville township.

The Timiskaming series has been traced from Teck township westerly into Grenfell and Eby townships as far as Kenogami lake.



A scene on Lower Twin lake, Maisonville township, showing a section of the Cobalt series in almost horizontal position.

The post-Timiskaming intrusives, with the exception of granite and syenite, are not nearly so widespread as in the townships to the east. There are a few dikes of lamprophyre throughout the Keewatin and the Timiskaming. On lot 4 in the fifth concession of Maisonville a lamprophyre contains numerous inclusions of greenstone and other rocks, simulating a conglomerate. This conglomerate-like lamprophyre has been observed at Cobalt and Kirkland lake. The granite and syenite are similar to the occurrences in the townships to the east. Feldspar-porphyry occurs only as narrow dikes. In one of these dikes on Wolf lake gold-bearing veins have been found.

There are rocks of the Cobalt series extending from Kenogami station westerly to Kenogami lake. On the east shore of this lake there is a minor unconformity in the Cobalt series. Fragments of a slate-like greywacké from the lower part of the series are included in a coarse conglomerate overlying the greywacké. This occurrence is similar to that on Obushkong lake, Gowganda.\*

There are also isolated exposures of the rocks of the Cobalt series along the westerly side of Grenfell and Maisonville townships.

\* Report, Bureau of Mines, Ont., Vol. XIX, Part 2, p. 176.



## Economic Notes

### Gold

A number of narrow quartz veins occur in rocks of the Keewatin system and also in the intrusive reddish feldspar-porphyry in the township of Maisonville, and in Grenfell along the south boundary of Maisonville. Native gold has been reported in several veins on properties along the railway to the north of Sesekinika lake. Several shallow shafts or pits have been sunk on these veins in recent years, but during the fall of 1913 very little work was being done. There was, however, some activity in the vicinity of Wolf lake and in the area south of this lake toward Sesekinika.

The Dane Copper Mining Company was prospecting part of lot 5 in the fifth concession of Maisonville, to the east of Wolf lake. A great part of the work consisted in trenching on the strike of veins that had recently been discovered. On the north part of the property the country rock is amygdaloidal basalt, which is quite schistose near the veins. There are three parallel quartz veins, having a strike of nearly north-west and southeast. The veins occur in schistose rock that is highly impregnated with crystallized iron pyrites. A shaft has been sunk on one vein to a depth of 50 feet. About one-half mile to the southeast there is an outcrop of reddish feldspar-porphyry in which there are several quartz veins with showings of visible gold. One of these veins has been stripped for 400 feet. Masses of porphyry are included in the vein.

In September, 1913, a gold-bearing quartz vein was discovered on lot 6 in the first concession, Maisonville, just to the south of Kapakita creek. The vein, which averages less than six inches in width, has been traced for 150 feet. Some gold and iron pyrites were observed in parts of the vein. The wall rock is greenstone of a massive character, and has been little altered by secondary solutions.

### Lead and Zinc

Narrow calcite veins, carrying small amounts of galena and zinc blende, have been found in the greenstone on the west shore of Wewegimok lake. To the south of Wolf lake there are several quartz-calcite veins carrying similar minerals. On claim H. R. 580, belonging to Mr. Dan Smith, of Sesekinika, one of these veins has been stripped or trenched for 200 feet. The vein, which is 14 inches wide at one place on the surface, carries a high proportion of galena and zinc blende. A shaft has been sunk 50 feet and several tons of lead-zinc ore have been piled up. The quartz has been deposited along the walls of the fissure, while the calcite, with most of the sulphides, has filled the centre.

### Iron Pyrites

On lot 7, in the third concession of Maisonville, the iron formation is much fractured and impregnated with iron pyrites, pyrrhotite and a little copper pyrites. A sample of pyrrhotite on analysis showed a trace of nickel. The rock in the vicinity is greatly oxidized, and this locality is worthy of prospecting for iron pyrites, a mineral used in the manufacture of sulphuric acid.

## More Recent Discoveries of Gold in Maisonville

A discovery of native gold and telluride of silver and gold in quartz veins was made early in June, 1914, on the Labine-Smith claims in the north part of lot 9 in the second concession of Maisonville township. The quartz veins have a general strike of N. 20° E., magnetic. The dip is generally to the west, but one vein with a width of two feet dips to the east. Some material carrying considerable native gold and telluride was taken from a narrow vein on the east side of the property. This vein, which at one exposure has a width of six inches, has been traced over several



hundred feet by means of trenches. The quartz, which is of a milky white character, carries small amounts of iron pyrites, while at places the wall rock carries this mineral abundantly. An examination of some specimens shows the telluride and gold to occur in fractures in the quartz. The former mineral sometimes has a plate-like structure, and again may occur in small masses readily recognized in hand specimens. Some of the quartz has a comb structure.

An assay of the telluride by Messrs. Campbell and Deyell, Cobalt, gave the following results: Silver 43.3 per cent., gold 20 and tellurium 28.32. The balance of the sample is composed of impurities like silica and carbonate. The analysis corresponds to that of the mineral petzite. Another telluride also appears to be present.

The occurrence of tellurides in gold-bearing veins in northern Ontario is gradually being extended.

The veins occur in the Keewatin, which consists of ellipsoidal greenstone with intrusions of a coarse-grained diabase. There is a small feldspar-porphyry dike near vein No. 3.

On the Malouf claim (northwest quarter of the north half of lot 10 in the second concession), one-quarter of a mile west of the previously mentioned property, native gold has been discovered in quartz veins and oxidized wall rock. An excavation of 30 feet in length has been made on the deposit, which consists of narrow quartz veins dipping at a low angle to the west. The decomposed material from this cut was treated for a time in an arrastra located at the base of the hill near the railway track.

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# INDEX VOL. XXIII, PART II.

	PAGE
Acknowledgments . . . . .	32
Age of gold deposits . . . . .	18
Agriculture . . . . .	1, 2
Amikougami creek . . . . .	1
Amikougami lake.	
diabase . . . . .	6
glaciation . . . . .	2
greenstone . . . . .	4, 6, 7
lamprophyre . . . . .	12
photo . . . . .	5
Altitudes . . . . .	1
Analyses.	
calcite . . . . .	21
feldspar-porphyry . . . . .	6, 15
greenstone . . . . .	6
lamprophyre . . . . .	12
syenite . . . . .	14
Albite porphyry . . . . .	15, 25
Altaite (Telluride of lead) . . . . .	18, 21, 23, 24
Andesite . . . . .	4
Anikojigami. <i>See</i> Amikougami.	
Ankerite . . . . .	25
Assay of tellurides . . . . .	35
Augite lamprophyre . . . . .	12
Balm of Gilead . . . . .	1
Balsam . . . . .	1
Basalt . . . . .	4, 5, 31, 34
Beaverhouse lake . . . . .	2, 31
Bibliography . . . . .	35
Bismuth, telluride of . . . . .	23
Blanche river . . . . .	2
lamprophyre . . . . .	12
photos . . . . .	3, 5, 17
Bolton, L. L. . . . .	2
Boston creek . . . . .	8
greenstone . . . . .	4
lamprophyre . . . . .	12
Boston tp. . . . .	1
iron . . . . .	2, 8
syenite . . . . .	12
Bruce, E. L. . . . .	1, 6, 11, 14, 15, 35
Burnside gold mine . . . . .	10
feldspar-porphyry . . . . .	16
plan . . . . .	26
notes . . . . .	29
Burrows, A. G. . . . .	1
Calaverite . . . . .	18, 23
Calcite . . . . .	21, 24, 25, 34
California gold deposits . . . . .	18
Campbell. <i>See</i> Deyell.	
Cedar . . . . .	1
Charlton . . . . .	27
Chlorite . . . . .	21, 23
Clay, stratified . . . . .	4
Cobalt, Ont., lamprophyre at . . . . .	33
Cobalt series . . . . .	4, 17
age . . . . .	18
Twin lake, photo . . . . .	33
Conglomerate.	
Cobalt series . . . . .	4
Gull lake, photo . . . . .	11

	PAGE
Kirkland lake, photo . . . . .	7
O'Connell lake, photo . . . . .	9
Timiskaming series . . . . .	4, 14
Tough-Oakes mine . . . . .	1, 21, 22, 29
Copper . . . . .	8, 32
Copper pyrites . . . . .	21, 34
Costello gold claim . . . . .	31
Cripple Creek, Cal. . . . .	18
Crystal lake, fish . . . . .	2
Dane Copper Mining Co. . . . .	8, 32, 34
Dane-Larder lake road . . . . .	11
Development of mines . . . . .	25-32, 34
Deyell and Campbell . . . . .	23, 35
Diabase . . . . .	4, 6, 17
Doig lake . . . . .	4
Dolomite . . . . .	4, 8
Eby tp. . . . .	12, 33
Economic notes . . . . .	34, 35
Explorations, previous . . . . .	2
Feldspar-porphyry.	
analyses and notes . . . . .	15
gold in . . . . .	34
Maisonville tp. . . . .	35
microphotos . . . . .	16
post-Timiskaming series . . . . .	4, 6
relationship between, and veins . . . . .	18
Teck-Hughes mine . . . . .	30
Tough-Oakes mine . . . . .	25
Wright-Hargrave mine . . . . .	1
Fires (forest) . . . . .	1
Fish . . . . .	2
Foster, C. A. . . . .	32
Galena . . . . .	21, 34
Gami lake . . . . .	8
Gauthier tp. . . . .	1
dolomite . . . . .	4
gold . . . . .	31
rocks, sedimentary . . . . .	10
trees . . . . .	2
Geology . . . . .	4-24, 33
Glaciation . . . . .	2, 4
Gold.	
discovery . . . . .	1
economic notes . . . . .	34
Maisonville tp. . . . .	34, 35
tellurides . . . . .	18, 21, 23, 24, 35
Goodfish lake . . . . .	8
Granite . . . . .	4
Porcupine area . . . . .	18
Winnie lake . . . . .	14
Greenstone . . . . .	4
photo . . . . .	7
productive veins in . . . . .	19, 34, 35
Grenfell tp. . . . .	33, 34
Greywacké . . . . .	4
Tough-Oakes mine . . . . .	10, 21
Gull lake . . . . .	1, 10, 11
Hessite (Telluride of silver) . . . . .	18, 34, 35
Hills, height of . . . . .	1

	PAGE		PAGE
Hopkins, P. E. ....	1	Melonite .....	18
Hore, R. E. ....	35	Mica-lamprophyre .....	12
Hotchkin, M. W. ....	26	Microphotos.	
Hunton gold mine .....	17, 31	feldspar-porphyry .....	16
Huronian gold mine .....	18, 31, 32	quartz .....	23, 24
Iron (magnetite) .....	18	Miller, W. G. ....	2, 8
Iron formation .....	8	Mining development .....	25-32, 34
Boston tp. ....	2	Molybdenite .....	20, 21, 23, 24, 30
photo .....	13	Morrisette tp. ....	31
Maisonville tp. ....	34	Mud lake .....	13
Iron pyrites .....	21, 34	Murdock creek .....	6
Jaspilite in Boston tp. ....	2	Muskeg. <i>See</i> Swamps.	
Kalgoorlie, West Australia ....	15, 16, 18	Nickel .....	34
Kapakita creek .....	34	Oakes gold claim .....	31
Keewatin formation.		Obushkong lake .....	33
Kenogami .....	17	O'Connell, Charles .....	32
notes .....	4, 6, 8	O'Connell lake .....	9, 10
photos .....	5, 7	Origin of gold deposits .....	18
veins in, productive ....	19, 21, 34, 35	Otto lake .....	1, 17
Kenogami .....	10, 17	Otto tp. ....	1, 12, 14
Kenogami lake .....	2, 33	Parks, W. A. ....	8
Kirkland lake.		Petrography. <i>See</i> Microphotos.	
conglomerate .....	7, 10	Petzite .....	18, 35
diabase .....	17	Photomicrographs. <i>See</i> Microphotos.	
feldspar-porphyry .....	15, 20	Pickerel .....	2
lamprophyre .....	12, 32	Pike .....	2
notes on sections of ore from .....	24	Pine .....	1, 2
"    veins and minerals from ..	21	Poplar .....	1, 2
picturesque .....	2	Porcupine gold area .....	18
photos .....	3, 17	Porphyry.	
unconformity on .....	6, 7	gold-bearing veins in .....	21, 34
Labine-Smith claim .....	34, 35	Tough-Oakes mine .....	<i>Frontispiece</i>
Lake trout .....	2	<i>See also</i> Feldspar-porphyry, Quartz-	
Lakes, character of .....	2	porphyry.	
Lamprophyre.		Post-Timiskaming intrusives.	
age .....	18	composition .....	4
analyses and notes .....	12	notes and photos .....	12-16
Maisonville tp. ....	33	Pre-Cambrian .....	4
photo .....	13	gold deposits in .....	18
Larder Lake .....	10	Pyrrhotite .....	18, 34
Larder Lake area .....	1, 9	Quartz.	
Lead .....	34	Swastika mine, photo .....	20
Lead, telluride of. ....	18, 21, 23, 24	Tough-Oakes mine, section .....	24
Lebel tp.		Wright-Hargrave mine, section. ....	23
copper .....	32	Quartz-calcite veins .....	34
greenstone .....	4	Quartz-feldspar-porphyry .....	8
iron formation .....	13	Quartz-porphyry .....	4, 31
syenite .....	12	Quartzite .....	4
Timiskaming series .....	9	Quasis lake. <i>See</i> Victoria lake.	
Lindgren, W. ....	18	Robbins gold claim .....	31
Lucky Cross gold mine .....	1	Rogers, W. R. ....	32
McElroy tp. ....	1, 3	Rothwell, T. E. ....	32
MacLaren, M. ....	15, 16	Round lake .....	1
McNeill, W. K. ....	23, 32	Sand plains .....	1, 2
McVittie tp. ....	10	Sesekinaka lake .....	2, 34
Magnetite .....	18	Silver, telluride of. <i>See</i> Hessite.	
Mahaffy, A. F. ....	32	Smith, Dan. ....	34
Malory gold claim .....	35	Smith, G. J. ....	32
Maisonville tp. ....	14, 33	Smith, R. M. ....	32
mining in .....	34, 35	Soil .....	1, 2
Maps.		Spearman, Chas. ....	35
Burnside and Tough-Oakes mines. ....	26, 28	Specularite .....	18
<i>See also</i> Table of Contents.			



	PAGE
Speight, O. L. S. ....	2
Spruce . . . . .	1, 2
Sulphuric acid . . . . .	34
Swamps . . . . .	1
Swastika . . . . .	1
feldspar-porphyry . . . . .	15
greenstone . . . . .	4
mines near, notes on . . . . .	20
Swastika gold mine . . . . .	1
notes . . . . .	20
photo . . . . .	17
veins, character of . . . . .	19
Syenite . . . . .	4, 12, 14
Sylvanite gold claim . . . . .	31
Teck tp. . . . .	1
copper . . . . .	32
feldspar-porphyry . . . . .	6
greenstone, analysis . . . . .	6
Timiskaming series . . . . .	9, 14, 23
Teck-Hughes mine. . . . .	
feldspar-porphyry . . . . .	15
notes . . . . .	30
Tellurides . . . . .	18, 21, 23, 24, 34
Temiskaming. <i>See</i> Timiskaming. . . . .	
Tetradymite (Telluride of bismuth). . . . .	23
Timber . . . . .	1, 2
Timiskaming and Northern Ontario . . . . .	
Railway . . . . .	1, 10
Timiskaming series. . . . .	
composition . . . . .	4
Eby and Grenfell tps. . . . .	33
notes and photos . . . . .	9-11
Tough-Oakes mine. . . . .	
conglomerate . . . . .	21, 29
feldspar-porphyry . . . . .	15
greywacké . . . . .	10, 21

	PAGE
lamprophyre . . . . .	12
molybdenite . . . . .	21
ore, photos of . . . . .	22
plans of . . . . .	26, 28
plant of, photo . . . . .	27
quartz . . . . .	24
report on . . . . .	25-28
road to . . . . .	1
specularite . . . . .	19
tellurides . . . . .	23
vein, photo of. . . . .	<i>Frontispiece</i>
Tourmaline. . . . .	18
Trees . . . . .	1, 2
Trout . . . . .	2
Tyrrell, J. B. . . . .	35
Twin lake . . . . .	33
Victoria (Quasis) lake . . . . .	1
West Australian telluride deposits. . . . .	15-19
Wettlaufer gold claim . . . . .	31
Wewegimok lake . . . . .	34
Wilson, M. E. . . . .	10
Wilson, W. J. . . . .	2
Winnie lake . . . . .	14
Wishman gold claim . . . . .	12, 13
Wolf lake . . . . .	34
Wood gold claim . . . . .	31
Wright gold claim . . . . .	31
Wright-Hargrave gold mine. . . . .	
discovery . . . . .	1
notes . . . . .	31
quartz . . . . .	23
Young, R. W. . . . .	32
Zinc blende . . . . .	21, 34









ANNUAL REPORT  
OF THE  
Inspector of Division Courts  
FOR THE  
PROVINCE OF ONTARIO  
FOR THE YEAR  
1913

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PRINTED BY ORDER OF  
THE LEGISLATIVE ASSEMBLY OF ONTARIO

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TORONTO:  
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1914

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TORONTO

*To His Honour* COLONEL THE HONOURABLE SIR JOHN MORISON GIBSON,  
K.C.M.G., ETC., *Lieutenant-Governor of Ontario.*

MAY IT PLEASE YOUR HONOUR:

The undersigned has the honour to present to Your Honour the Report of the Inspector of Division Courts, of the Province of Ontario, for the year ending 31st December, 1913.

Respectfully submitted,

J. J. FOY,

*Attorney-General.*

Toronto, March 16th, 1914.

SIR,—I have the honour to submit herewith, to be presented to His Honour the Lieutenant-Governor, the Report of the Inspector of Division Courts, for the year ending 31st December, 1913.

I have the honour to be, Sir,

Your obedient servant,

J. B. MACDONALD,

*Inspector.*

*To the Honourable J. J. Fox, K.C., M.P.P.,*

*Attorney-General, Toronto.*



ANNUAL REPORT  
OF THE  
**Inspector of Division Courts**  
FOR THE  
**Province of Ontario**

FOR THE YEAR ENDING 31st DECEMBER, 1913

TORONTO, MARCH 16TH, 1914.

*To His Honour, Colonel The Honourable SIR JOHN MORISON GIBSON, K.C.M.G.,  
Lieutenant-Governor of Ontario.*

MAY IT PLEASE YOUR HONOUR:

I have the honor to submit the Annual Report of the business of Division Courts of the Province of Ontario for the year ending 31st December, 1913.

A comparison of the figures of last year with those of the preceding year (1912) shows a large increase in the volume of business done.

The number of suits entered in 1913 exclusive of transcript of judgment and judgment summons was 63,675 as against in 1912 60,914, or an increase of 2,761.

The total amount of claims entered exclusive of transcripts of judgments and judgment summons in 1913 was \$2,433,162.82 as against, in 1912, \$2,230,017.61, or an increase in 1913 of \$203,145.21.

The total amount of suitor's money paid into court in 1913 was \$1,002,288.36 as against, in 1912, \$891,207.48, or an increase in 1913 of \$111,080.88.

The total amount of suitor's money paid out of court in 1913 was \$964,924.42 as against, in 1912, \$881,890.96, or an increase for 1913 of \$83,023.46.

All the rest of the business in the courts has increased proportionately—as shown in Table A.

The creation of the new District of Temiskaming necessitated several meetings of the Division Court Board for its establishment, and the re-arranging of the boundaries of the Districts of Nipissing and Sudbury.

The boundaries of the limits of these Districts will be found under Table D.

The list of officials of the various courts throughout the Province, with their address, will be found under Tables B. and C.

The new Tariff of Fees and Rules, Orders and Forms for Division Courts, as prepared by the Board of County Judges, and approved by the Judges of the Supreme Court goes into effect on the First of April 1914.

The increase in the fees of both Clerks and Bailiffs is very considerable, and will largely supplement their incomes.

Inspection of the offices shows a very satisfactory condition of affairs throughout, and with the large increase in emoluments, under the new Tariff of Fees, even greater efficiency, in the discharge of their duties by officials, is anticipated.

All of which is respectfully submitted.

I have the honour to be,  
Your Honour's obedient servant,

J. B. MACDONALD,

*Inspector.*

TABLE

Return of Division Court Business from the 1st day of January

Name of County, United Counties, or District.	Number of Divisions.	Number of suits entered exclusive of transcripts of judgments and judgment summonses.	Amount of claims entered exclusive of transcripts of judgments and judgment summonses.	Number of transcripts of judgments received from other Courts.	Amount of claims received by transcripts of judgments from other Courts.	Number of judgment summonses issued.	Balance of cash in Court from the previous year.	Total amount of suitors' money paid into Court.	Total amount of suitors' money paid out of Court.	Balance of cash in Court.	Number of suits entered where the amount claimed does not exceed \$100, exclusive of transcripts of judgments from other Courts.
		\$	c.		\$	c.	\$	c.	\$	c.	
Algoma .....	1	890	39,608	47	3,321	43	14	1,396	20,277	40	829
	2	40	1,639	2	84	01		780	780	08	37
	3	123	4,576	8	538	33	11	1,819	1,751	85	131
	4	36	1,360	6	263	36	2	1,175	1,135	68	35
	5	158	4,846	7	36	82	5	2,281	2,272	83	151
Brant .....	1	845	30,968	44	2,541	83	54	498	10,746	61	792
	2	81	1,646	11	388	85	4	1,408	1,408	70	80
	3	32	969	3	388	95	2	778	777	25	92
	4	44	2,144	5	307	77	4	2,009	1,207	70	30
	5	29	1,285	3	144	21		417	417	08	24
Bruce.....	1	91	3,540	10	1,528	50	6	1,199	1,199	91	2
	2	53	2,802	10	274	16		895	895	90	51
	3	52	1,752	4	224	46	8	957	927	34	38
	4	59	1,255	3	95	81		839	839	75	58
	5	94	3,106	10	307	43		1,382	1,382	58	83
	6	6	286	2	45	95	1	194	194	85	5
	7	58	2,118	6	342	47	1	504	504	14	59
	8	155	6,187	6	256	73	21	2,145	2,182	61	163
	9	22	1,066	1			1	524	524	52	1
	10	41	1,418	3	231	64	3	258	231	76	
	11	79	2,253				3	1,210	1,210	78	41
	12	78	3,276	3	161	16	5	437	437	27	76
Carleton .....	1	3,071	131,258	53	2,729	55	656	1,699	29,070	60	2,814
	2	41	2,537	3	309	50	1	1,545	1,545	42	32
	3	29	2,092	6	398	57	1	1,162	1,108	71	21
	4	14	896	1	19	07	31	368	399	24	1
	5	22	722	2	45	00	1	405	452	67	21
	6	44	1,732	8	366	44	4	1,202	1,161	21	40
	7	142	4,007	9	519	59	29	1,295	1,191	31	138
Dufferin .....	1	87	4,263	3	505	42	2	1,511	1,502	95	78
	2	83	2,683	7	396	79	8	1,042	1,042	24	73
	3	27	617	2	233	76		429	409	02	20
	4	3	260	2	124	85		215	215	80	2
	5	42	2,159	4	220	44	1	376	376	98	35
Elgin .....	1	250	8,084	22	1,125	16	32	4,904	4,841	16	173
	2	25	1,015	1	2	81		626	630	17	25
	3	955	28,343	28	1,549	87	109	13,949	13,885	86	918
	4	123	4,407	3	371	00	3	1,026	1,031	16	114
Essex. ....	1	34	740	1	24	26	2	206	200	83	34
	2	95	2,732	3	255	38	10	1,026	1,006	79	93
	3	48	2,795	13			2	1,130	1,030	46	40
	4	60	1,720	39	138	86	5	1,279	1,279	64	59
	5	179	6,904	35	288	88	32	3,289	3,376	71	173
	6	18	866	46			1	656	643	96	12
	7	636	23,142	13	153	15	225	9,215	8,563	10	342
	8	211	8,042	80	385	99	19	5,664	5,581	93	196
	9	50	1,508	84	109	36	3	1,022	1,072	50	50
	10										

## A.

to the 31st day of December, A.D. 1913 inclusive, shewing:

Number of suits entered where claim does not exceed \$200.	Number of actions for tort, where the amount claimed does not exceed \$60.	Number of personal actions, where the parties consent thereto in writing and the amount claimed does not exceed \$100.	Number of actions of replevin, where the value of the goods or other property or effects distrained, taken or detained, does not exceed the sum of \$60.	Number of suits entered for claims not exceeding \$10.	Number of jury trials by juries summoned.	Amount paid to jurors summoned.	Number of jury trials by jurors called in pursuance of section 142, D.O.A.	Amount payable to County Treasurer for "Division Court Jury Fee Fund."	Amount of fees and emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' fees.	The amount of costs so taxed.	Return of judgment debtors ordered to be committed.	The number of such debtors actually committed.	Clerk's returns of emoluments.	Bailiff's returns of emoluments.	Unclaimed moneys in pursuance of section 43 D.O.A.
\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
61				95							10 00			2,016 15	640 83	
1														54 80		
5				29										252 10		
1														101 91	182 00	
6				33										257 75	140 72	
53	16	5	1	210				25 70		1	6 00	4		1,499 30	634 93	
1				25				1 09						174 10	112 02	
5				12				1 17						59 85	26 83	
1				11				2 06						126 70	49 00	
4				4				1 51						55 90	44 83	
4				23	1	13 20		3 64						184 60	188 88	
2								1 52		1	5 00			127 49	111 43	
2				15				1 49		1	5 00			136 88	71 78	
1				19				1 09						101 90	65 54	
1				19				1 51		1	5 00			175 04	125 54	
1				1				37						16 00	17 45	
12				13				1 67						124 50	97 21	
19	6			31				6 01		1	8 00	3		353 50	271 04	
3				7				1 20						30 95		
3								1 56						84 34		
3				34				1 96						126 05	52 80	
6				10				3 24						147 75		
238	6		9	489				126 08 987 84		6	43 00	256	7	6,939 20	2,353 49	10 80
9				2				3 18						116 55	123 32	
7				2				2 48		1	10 00			69 66	49 52	
3				1				1 03		1	5 00			32 55	21 48	
1				4				58						40 00	87 74	
4				8				1 69						115 50	96 71	
3				42				2 48						336 58		
8				19				4 17		1	10 00			220 50	98 68	
6				32				32		1	5 00	2		202 26		
1				12				52						48 49	64 90	
1								34						10 61		
4				7	1	12 00		2 08						74 00	33 88	
10				67				8 64				8	1	628 65	383 16	
37	4			1	5	53 00		60				2		75 25	71 17	
10	5		2	257	1			22 30				25	1	1,901 40	1,160 99	
	2			38				4 30						212 03	217 18	
				10				49						59 25	86 55	
3				33				2 46		1	5 00	4		218 85	94 09	
7				4	1	5 00		3 39						120 20	67 28	
1				13				1 33				1		165 55	115 78	
6				44	3	33 00		5 13				5		355 60	197 08	
2				4	1	24 00		89				1		48 85		
6	2		3	283	4	45 00		9 39		4	25 00	58	2	1,856 18	437 10	
16	3			49	2	23 00		7 42		3	22 00	7		491 75	269 96	
				12				96						109 25	70 95	



TABLE

## Return of Division Court Business from the 1st day of January

Name of County, United Counties, or District.	Number of Divisions.	Number of suits entered exclusive of transcripts of judgments and judgment summonses.	Amount of claims entered exclusive of transcripts of judgments and judgment summonses.	Number of transcripts of judgments received from other Courts.	Amount of claims received by transcripts of judgments from other Courts.	Number of judgment summonses issued.	Balance of cash in Court from the previous year.	Total amount of suitors' money paid into Court.	Total amount of suitors' money paid out of Court.	Balance of cash in Court.	Number of suits entered where the amount claimed does not exceed \$100, exclusive of transcripts of judgments from other Courts.
			\$ c.		\$ c.		\$ c.	\$ c.	\$ c.	\$ c.	
Frontenac ..	1	822	25,427 56	22	864 21	113	42 72	9,040 19	9,027 13	55 78	788
	2	15	328 51	2	96 68	.....	83 56	245 71	274 31	54 96	15
	3	61	2,535 80	9	512 96	5	.....	1,222 06	1,222 06	.....	56
	4	89	3,218 60	6	185 77	10	39 80	1,329 13	1,297 85	30 85	85
	5	12	379 52	.....	.....	4	.....	44 60	44 60	.....	10
	6	40	1,872 54	8	172 18	2	.....	1,075 41	1,072 41	3 00	35
	7	42	1,143 32	.....	.....	4	.....	405 32	405 32	.....	44
Grey .....	1	532	14,516 20	25	848 00	52	214 04	5,516 92	5,588 44	142 52	513
	2	65	2,718 38	8	400 14	6	.....	1,088 27	1,046 64	41 63	8
	3	195	5,726 17	8	345 11	10	.....	1,748 57	1,748 57	.....	186
	4	52	2,475 38	11	1,019 63	4	16 04	924 77	940 81	.....	48
	5	115	4,582 54	10	504 25	4	126 56	2,369 37	2,330 28	165 65	105
	6	28	1,281 48	1	111 05	2	.....	1,075 31	1,074 31	1 00	25
	7	106	2,806 69	13	1,053 88	7	7 30	1,515 61	1,449 82	73 09	100
	8	78	3,314 42	5	396 31	11	83 03	1,194 99	1,219 02	59 00	72
Haldimand .....	1	67	2,639 82	5	305 90	7	50 51	1,234 35	1,053 00	231 86	64
	2	40	1,885 26	2	61 79	14	24 69	1,247 16	1,249 33	22 52	26
	3	278	7,281 12	17	1,020 43	71	366 44	2,545 78	2,446 43	495 79	15
	4	79	2,465 00	2	135 00	7	305 94	1,512 14	1,580 67	237 41	66
	5	13	702 85	2	70 03	2	.....	872 28	665 65	.....	13
Haliburton .....	1	49	1,523 53	4	90 46	3	.....	690 08	690 08	.....	48
	2	42	1,330 28	1	24 33	2	27 70	719 97	682 51	65 16	40
	3	62	2,857 26	5	252 49	12	.....	483 62	483 62	.....	55
	4	2	76 49	.....	.....	.....	.....	76 49	76 49	.....	2
Halton .....	1	122	4,769 60	15	735 70	29	49 44	2,349 95	2,388 86	10 50	109
	2	72	2,818 67	12	451 44	12	17 09	1,176 57	1,168 36	25 30	66
	3	198	3,587 51	4	59 61	.....	105 82	2,940 85	2,862 51	269 48	186
	4	13	870 32	3	14 75	1	.....	119 48	105 48	4 00	10
	5	11	450 06	.....	.....	1	.....	74 20	74 20	.....	11
	6	120	4,789 21	12	709 64	2	30 61	2,074 01	2,019 01	85 61	111
Hastings....	1	727	18,643 32	16	769 82	58	564 05	10,075 67	9,793 86	845 86	453
	2	46	1,367 85	3	177 11	5	168 33	613 51	598 59	183 25	49
	3	14	469 02	.....	.....	.....	.....	111 57	116 57	.....	5
	4	128	4,048 97	10	265 20	7	58 86	2,275 37	2,264 47	69 76	117
	5	118	4,318 63	7	566 15	4	39 45	1,513 48	1,470 34	82 59	109
	6	116	4,185 67	13	611 32	3	.....	2,029 62	2,017 52	12 10	108
	7	36	652 91	4	167 95	3	31 75	278 01	282 87	26 89	36
	9	292	8,146 55	18	898 34	16	10 20	4,947 06	4,673 42	273 64	286
	10	59	1,426 63	7	147 10	9	54 00	793 20	759 20	34 00	3
	11	47	1,330 03	3	137 90	1	177 09	688 23	677 38	187 96	48
	12	81	3,049 38	.....	.....	.....	89 34	1,493 88	1,516 95	66 27	86
Huron .....	1	157	5,396 16	9	606 75	10	91 02	2,144 69	2,212 65	23 06	147
	2	100	4,030 58	6	318 06	8	227 10	1,913 19	2,053 37	86 92	59
	3	62	2,931 94	7	308 36	4	.....	1,028 19	1,028 19	.....	59
	4	36	.....	3	28 48	3	50	1,909 51	1,899 51	10 00	32
	5	46	1,541 45	3	211 59	5	2 00	786 73	759 43	29 30	33
	6	28	850 72	3	213 79	1	.....	889 92	888 92	.....	.....
	7	7	358 90	1	17 35	1	.....	226 87	226 87	.....	5
	8	116	5,300 19	10	298 10	9	86 38	1,715 19	1,700 49	14 70	98
	9	87	1,948 35	4	98 80	6	.....	855 93	807 09	.....	82
	10	20	76 02	2	95 06	4	.....	727 21	727 21	.....	23
	11	7	611 17	.....	.....	.....	10 85	267 10	256 00	10 10	4
	12	21	1,034 03	2	79 30	3	.....	558 50	558 50	.....	21



A.—Continued.

to the 31st day of December, A.D. 1913, inclusive, etc.—Continued.

Number of suits entered where claim does not exceed \$200.	Number of actions for tort, where the amount claimed does not exceed \$50.	Number of personal actions, where the parties consent thereto in writing and the amount claimed does not exceed \$100.	Number of actions of replevin, where the value of the goods or other property or effects distrained, taken or detained, does not exceed the sum of \$50.	Number of suits entered for claims not exceeding \$10.	Number of jury trials by juries summoned.	Amount paid to jurors summoned.	Number of jury trials by jurors called in pursuance of section 142, D.C.A.	Amount payable to County Treasurer for "Division Court Jury Fee Fund."	Amount of fees and emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' fees.	The amount of costs so taxed.	Return of judgment debtors ordered to be committed.	The number of such debtors actually committed.	Clerk's returns of emoluments.	Bailiff's returns of emoluments.	Unclaimed moneys in pursuance of section 43, D.C.A.
35				272		\$ c.		\$ c.	\$ c.		\$ c.	21	3	\$ c.	\$ c.	\$ c.
5				6				21 04						1,538 70	697 69	82 88
4				13				24						28 71		
2				11				2 45						144 95	91 82	
9				4				2 21						184 48	148 17	
2				2				2 30						135 36	99 94	
6				17				75						87 92	66 13	
19			1	168	3	36 00		12 26		2	15 00			1,163 24	673 69	
5	3							2 66						172 80	145 35	
4	10			38				4 93		1	5 00			389 55	187 58	
2				2				1 75						157 25	207 26	
10	2			25	1	14 80		4 26						280 50	275 80	
6	4			4										71 90	103 65	
6	2			36	1	12 00		3 00						209 10	114 95	
7				12				3 20						210 95	120 00	
3	5			6				2 26						180 65	65 38	
6	1			6				2 31						113 34	54 21	
13	3			115	2	24 00		6 07						553 35	132 42	
4				13				2 89						165 55	125 43	
				2				26						32 94	35 13	
1	2			7				1 18						109 57	94 32	
7	4			13				1 19						114 09	38 30	
				9				3 10						145 50	132 42	
								3						4 20	3 40	
15	7			31				4 88						341 80	*60 00	
5				6	1	33 00		2 75						133 85	66 57	
7				19				3 38						245 48	136 89	
1				5				87						*14 00	22 08	
				1				36						30 53		
9				22				4 53		1	5 00			274 46	176 25	
21	8		1	250	2	39 80		15 68						1,675 05	875 78	
2				16				1 10						112 99		
1				1				43						17 24	29 36	
5				33				3 38		1	5 00			244 60	193 18	
9	2			36	2	20 00		4 05		2	10 00			256 90	182 36	
2	1			21				4 13						168 60	152 51	
6				17				36						79 50		
1	1		1	92	2	22 00		6 96		2	15 00			712 69	479 87	
				14	1	12 00		1 51						198 00	71 23	
				10				1 02						97 40	111 67	
1	1		1	13				2 26						176 40	129 03	
10				40				5 20		2	10 00			379 31	128 25	
13				25				4 42						214 60	128 94	
8	6			6				3 44						148 55	55 06	
3				9				2 40						96 50	62 18	
				7				1 53						88 55	60 50	
				19				60						54 55	71 45	
1				1				06						7 70	11 32	
14	1		1	33				6 00						239 80	166 57	
5				48	1	12 00		1 97						124 75	130 41	
1								73						46 35	37 36	
3								62						19 81	24 39	
3				7				1 26		1	12 00			48 17	44 69	

\* Part of year only.

TABLE

## Return of Division Court Business from the 1st day of January

Name of County, United Counties, or District.	Number of Divisions.	Number of suits entered exclusive of transcripts of judgments and judgment summonses.	Amount of claims entered exclusive of transcripts of judgments and judgment summonses.	Number of transcripts of judgments received from other Courts.	Amount of claims received by transcripts of judgments from other Courts.	Number of judgment summonses issued.	Balance of cash in Court from the previous year.	Total amount of suitors' money paid into Court.	Total amount of suitors' money paid out of Court.	Balance of cash in Court.	Number of suits entered where the amount claimed does not exceed \$100, exclusive of transcripts of judgments from other Courts.
			\$ c.		\$ c.		\$ c.	\$ c.	\$ c.	\$ c.	
Kenora .....	1	400	16,831 24	4	265 09	7	836 72	8,538 01	7,503 38	1,871 35	381
	2	7	447 09	.....	.....	.....	11 40	476 48	487 88	.....	6
	3	45	1,870 56	.....	.....	.....	.....	836 39	836 39	.....	42
	4	72	3,178 03	7	873 11	.....	63 96	1,654 21	1,062 60	591 61	62
Kent.....	1	634	26,076 00	21	1,004 84	130	1,680 53	11,696 32	12,959 33	417 52	570
	2	187	7,210 11	26	1,663 74	21	50 19	3,773 87	3,690 73	133 33	117
	3	149	2,566 72	4	178 07	13	12 17	1,690 19	1,549 20	153 16	147
	4	119	4,591 32	5	83 25	34	1 61	2,759 76	2,761 37	.....	73
	5	242	6,851 28	17	763 45	24	132 52	4,479 59	4,410 12	201 99	232
	6	76	4,001 91	4	258 38	6	.....	1,101 58	1,054 38	47 20	68
	7	178	6,396 73	20	1,099 25	6	126 78	3,826 33	3,907 09	46 02	171
Lambton.....	1	695	20,981 58	18	899 99	53	490 15	11,573 65	11,568 62	495 18	643
	2	62	4,383 53	7	319 13	.....	20 95	1,577 24	1,567 01	10 23	47
	3	42	1,713 99	25	847 37	.....	.....	1,419 88	1,419 88	.....	37
	4	31	1,353 53	9	37 33	7	.....	483 04	483 04	.....	30
	5	58	1,775 99	1	36 45	1	.....	732 95	732 95	.....	53
	6	26	808 92	1	53 75	2	.....	395 82	395 82	.....	26
	7	9	448 02	2	85 15	.....	.....	147 49	132 13	15 36	7
	8	129	5,661 75	13	326 80	8	29 16	2,148 76	2,177 92	15 68	121
	9	57	1,833 57	7	525 18	4	12 00	1,754 14	1,667 74	98 40	52
Lanark.....	1	180	5,343 81	10	459 73	17	115 78	3,509 54	3,414 14	211 18	167
	2	57	2,095 18	3	80 13	4	15 00	1,321 99	1,278 65	43 04	50
	3	163	4,204 66	2	84 86	33	.....	1,657 50	1,657 50	.....	100
	4	349	10,724 41	4	135 22	15	257 20	4,492 14	4,317 27	432 07	338
	5	85	2,580 77	4	331 29	9	.....	626 26	626 26	.....	82
Leeds and Grenville ..	1	739	17,949 49	15	609 60	46	57 20	8,061 17	8,400 00	18 26	753
	2	144	3,687 35	9	324 52	14	179 93	1,743 19	1,611 29	311 80	140
	3	140	5,118 35	10	378 32	.....	41 29	3,462 47	3,481 12	72 64	133
	4	51	2,125 14	7	311 96	7	21 03	967 79	894 54	94 28	53
	5	52	1,783 55	2	110 37	1	.....	636 43	636 43	.....	.....
	6	102	3,918 92	5	348 21	18	54 28	2,212 83	2,098 53	14 30	82
	7	16	559 11	2	87 04	.....	5 15	190 18	135 86	57 47	15
	8	101	4,139 72	15	742 83	12	4 00	2,044 68	2,038 68	8 00	92
	9	39	1,551 63	2	140 21	.....	213 43	910 02	1,123 45	.....	35
	10	37	1,756 92	4	54 51	.....	.....	1,099 90	1,076 62	23 28	39
	11	15	266 51	.....	.....	3	.....	53 54	53 54	.....	15
	12	19	965 61	.....	.....	3	.....	352 55	352 55	.....	14
Lennox and Addington....	1	145	4,308 61	2	.....	28	150 94	2,051 99	2,149 20	53 75	139
	2	11	629 37	3	64 52	2	30 00	430 32	445 32	15 00	12
	3	5	156 17	1	12 77	1	4 85	79 12	83 97	.....	5
	4	25	876 70	.....	.....	1	4 02	140 73	138 73	6 02	25
	5	56	2,322 28	3	106 53	5	17 50	963 17	963 17	17 50	40
	6	12	355 80	.....	.....	6	113 07	350 73	461 90	1 92	12
	7	42	979 73	1	48 64	.....	34 40	858 84	823 24	70 00	41
	8	19	381 94	1	31 08	1	46 52	339 94	310 47	29 47	19
	9	7	386 57	.....	.....	.....	.....	94 95	94 95	.....	7

to the 31st day of December, A.D. 1913, inclusive, etc.—Continued.

Number of suits entered where claim does not exceed \$200.		Number of actions for tort, where the amount claimed does not exceed \$50.		Number of personal actions, where the parties consent thereto in writing and the amount claimed does not exceed \$100.		Number of actions of replevin, where the value of the goods or other property or effects distrained, taken or detained, does not exceed the sum of \$50.		Number of suits entered for claims not exceeding \$10.		Number of jury trials by juries summoned.		Amount paid to jurors summoned.		Number of jury trials by jurors called in pursuance of section 142, D.C.A.		Amount payable to County Treasurer for "Division Court Jury Fee Fund."		Amount of fees and emoluments payable to the Honourable the Treasurer for the use of the Province.		Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' fees.		The amount of costs so taxed.		Return of judgment debtors ordered to be committed.		The number of such debtors actually committed.		Clerk's returns of emoluments.		Bailiff's returns of emoluments.		Unclaimed moneys in pursuance of section 43, D.C.A.		
										\$	c.			\$	c.	\$	c.	\$	c.	\$	c.			\$	c.			\$	c.	\$	c.			
29	1				1	55																		1,005	59									
3	3					10																			16	70					40	60		
6						8																			78	16								
																									146	78					89	68		
41	5				114	2	50	1		26	17			2	16	00	31	3	1,653	09											853	62		
15	2				45					8	36						3								349	40					277	46		
2					76					1	91			1	10	00	1								249	14					171	68		
11					35					4	64						13	1							341	95					338	40		
10	5				91	2	19	00		5	71			1	10	00	5								524	95					274	76		
13					19					4	81														174	45					104	33		
16	7				54					5	91														361	10					320	54		
42	6				238	3	36	00		18	99			5	25	00	1		1,317	66											589	50		
8					15					2	90														151	80					140	42		
3					7					2	09														156	85					177	22		
1					1					1	12														60	98					83	30		
5					14					1	91														94	30					65	38		
2					4	1	12	0		1	29														48	92					48	64		
2					3					65															18	75					42	47		
8	2				33	1	8	00		4	79						1								249	30								
3					14					1	78														109	90					135	11		
11	2				70					5	10						7		469	10											110	43		
3					21					2	00								86	31											179	37		
5	1				56					3	39			1	7	50	13		321	85											142	91		
10					85					8	73						3		698	60														
3	4				28					2	01			1	7	50	2		152	10											126	67		
30					335	1	50			17	27						2		1,389	00											459	23		
4	1				51					2	98						1		237	60											115	58		
7					30					4	54			1	10	00			345	49											193	50		
					19					3	01								126	35											91	59		
18	1				14					1	96								109	75											52	11		
1					22	2	26	50		3	43						1		267	25											282	06		
4					2					52									37	64											29	97		
9	1				20					4	14								286	25											188	16		
4					12					1	60						1		83	00											84	59		
4					1					1	81			1	5	00			74	97											37	67		
					15					6									24	61											24	50		
2					5					95									49	60											65	30		
6	2				53					3	33			1	5	00	4		328	20											181	63		
1	1				4					68							1		39	05											23	00		
					5					12									11	32											6	51		
6	1				12					2	43								123	15											4	85		
					11					21									36	94											24	30		
1	1				5					94									116	20											75	09		
	4				18					43									43	76											43	38		
																			22	71											25	17		



TABLE

Return of Division Court business from the 1st day of January

Name of County, United Counties, or District.	Number of Divisions.	Number of suits entered exclusive of transcripts of judgments and judgment summonses.	Amount of claims entered exclusive of transcripts of judgments and judgment summonses.	Number of transcripts of judgments received from other Courts.	Amount of claims received by transcripts of judgments from other Courts.	Number of judgment summonses issued.	Balance of cash in Court from the previous year.	Total amount of suitors' money paid into Court.	Total amount of suitors' money paid out of Court.	Balance of cash in Court.	Number of suits entered where the amount claimed does not exceed \$100, exclusive of transcripts of judgments from other Courts.
			\$ c.		\$ c.		\$ c.	\$ c.	\$ c.	\$ c.	
Lincoln .....	1	51	2,150 53	8	802 50	2	.....	1 555 12	1,387 36	167 76	38
	2	664	22,128 36	47	2,903 67	70	245 79	10,376 59	10,215 97	406 41	632
	3	61	2,125 37	12	966 51	5	2 97	1,901 06	1,889 66	11 40	56
	4	57	1,891 51	14	1,089 73	8	.....	1,048 65	1,048 65	.....	60
	5	195	7,283 13	20	100 21	42	.....	3,106 75	3,051 49	55 26	183
Manitoulin .....	1	47	2,115 76	16	1,073 84	6	171 31	614 53	543 12	242 72	44
	2	76	2,485 66	.....	.....	4	26 55	1,017 95	1,044 50	.....	50
	3	12	768 29	9	437 90	3	265 00	.....	326 76	.....	10
Middlesex .....	1	1,865	69,793 96	46	2,294 19	77	585 17	26,950 93	27,038 13	497 97	1,140
	2	70	2,639 99	1	17 61	4	.....	1,635 69	1,635 69	.....	70
	3	83	2,398 85	12	547 38	3	68 08	2,419 87	2,468 81	19 14	81
	4	47	1,698 27	11	239 13	2	.....	1,020 16	873 56	146 60	45
	5	71	3,381 65	8	413 34	6	30 49	1,306 96	1,210 83	96 13	61
	6	119	5,921 86	8	402 34	5	54 00	2,335 43	2,335 43	54 00	99
	7	29	883 95	3	215 10	2	13 18	502 12	476 98	38 32	27
	8	9	326 55	7	689 46	.....	25 00	121 64	126 89	19 75	9
	9	433	9,085 27	6	301 38	76	218 36	3,450 57	3,213 60	236 97	420
Muskoka.....	1	131	7,845 69	6	208 95	21	156 85	2,441 90	2,439 12	159 63	108
	2	88	4,479 02	6	243 76	11	97 64	2,271 34	2,544 57	124 41	88
	3	117	4,164 08	13	1,008 82	29	82 46	1,410 02	1,431 25	61 23	91
	4	19	989 19	3	358 37	9	.....	563 33	557 83	5 50	19
Nipissing. ....	1	211	8,938 39	10	562 83	6	40 59	3,536 00	3,542 12	40 47	156
	2	71	3,344 96	6	361 78	1	15 30	2,239 66	2,199 66	40 00	66
	3	782	31,870 55	22	1,221 99	52	214 60	14,409 78	14,578 99	45 39	741
	4	61	3,496 50	2	219 24	1	99 45	1,282 06	1,281 51	.....	57
	5	43	2,008 53	3	232 29	1	.....	868 87	865 87	.....	39
	6	161	7,465 08	11	213 36	7	6 36	3,308 08	3,299 52	14 92	123
	7	765	36,569 82	43	2,561 64	93	861 40	15,772 74	15,996 02	641 12	699
	8	451	24,650 42	20	1,275 93	17	817 42	15,355 12	15,808 71	363 83	408
	9	502	23,419 28	32	2,367 61	99	58 45	6,565 11	6,507 31	116 25	397
Norfolk.....	1	279	6,464 10	5	216 41	86	263 48	2,609 39	2,306 35	303 04	272
	2	30	1,111 78	7	726 18	4	40 00	790 18	824 18	6 00	30
	3	8	316 16	2	22 48	2	.....	213 82	213 82	.....	10
	4	48	1,361 55	8	403 92	6	56 60	781 52	788 57	49 55	46
	5	24	1,200 66	1	22 16	.....	.....	352 57	352 57	.....	22
	6	142	5,509 12	9	358 92	18	.....	2,611 10	2,611 10	.....	134
	7	29	948 05	9	290 23	7	43 65	379 54	353 06	70 13	29
	8	60	1,630 36	2	44 44	2	.....	534 31	534 31	.....	61
Northumberland and Durham ..	1	129	5,191 30	7	271 65	3	94 34	2,259 35	2,111 47	242 22	115
	2	32	1,157 90	5	319 13	2	25 42	802 71	811 49	46 64	32
	3	151	5,526 43	13	631 84	2	40 00	1,924 85	1,926 28	38 57	112
	4	55	2,557 39	2	379 83	6	82 13	873 84	867 76	88 21	50
	5	294	9,064 11	14	357 28	24	.....	2,171 36	2,036 98	134 39	277
	6	57	1,488 85	.....	.....	5	.....	639 09	635 09	.....	61
	7	159	5,125 33	11	905 67	27	69 60	2,159 98	2,013 92	215 66	148
	8	96	4,673 00	5	405 00	22	125 32	842 37	931 00	36 69	92
	9	82	3,435 89	7	454 45	7	.....	1,983 10	1,983 10	.....	75
	10	57	2,123 96	3	124 80	4	.....	426 65	418 65	8 00	52
	11	315	7,310 05	20	1,568 89	35	159 72	3,495 01	3,495 01	.....	312

\* Part of year only.



A.—Continued.

to the 31st day of December, A.D. 1913, inclusive, etc. —Continued.

[illegible]

TABLE

## Return of Division Court Business from the 1st day of January

Name of County, United Counties, or District.	Number of Divisions.	Number of suits entered exclusive of transcripts of judgments and judgment summonses.	Amount of claims entered exclusive of transcripts of judgments and judgment summonses.	Number of transcripts of judgments received from other Courts.	Amount of claims received by transcripts of judgments from other Courts.	Number of judgment summonses issued.	Balance of cash in Court from the previous year.	Total amount of suitors' money paid into Court.	Total amount of suitors' money paid out of Court.	Balance of cash in Court.	Number of suits entered where the amount claimed does not exceed \$100, exclusive of transcripts of judgments from other Courts.
			\$ c.		\$ c.		\$ c.	\$ c.	\$ c.	\$ c.	
Ontario .....	1	23	8,116 23	17	807 87	21	19 87	3,093 86	3,051 77	42 09	222
	2	57	1,950 48	2	217 80	2	.....	1,209 86	1,209 86	.....	36
	3	38	1,790 00	2	160 00	2	.....	980 98	.....	.....	33
	4	149	6,213 56	2	475 07	13	242 64	1,888 75	1,869 70	261 69	9 5
	5	81	2,965 46	12	318 56	.....	.....	2,503 80	2,403 80	100 00	83
	6	27	945 88	.....	.....	.....	.....	510 81	540 81	.....	27
	7	19	886 42	9	748 58	6	117 41	408 18	462 28	62 31	18
Oxford.....	1	952	32,743 43	38	2,306 87	154	37 28	24,104 30	24,053 21	88 37	72
	2	57	2,246 18	3	231 04	4	.....	1,250 50	1,200 13	50 37	55
	3	39	1,724 26	1	75 24	.....	.....	942 29	942 29	.....	34
	4	163	5,492 66	15	516 91	24	190 11	4,079 36	3,889 37	189 99	108
	5	308	9,723 62	11	318 35	25	133 07	4,837 75	4,848 52	361 94	284
	6	252	8,619 05	11	588 67	20	239 00	3,546 05	3,422 42	152 63	241
	7	29	635 48	.....	.....	.....	.....	306 28	310 18	5 10	23
Parry Sound ...	1	179	5,773 60	7	194 85	2	225 77	2,478 01	2,312 89	165 12	169
	2	11	492 21	2	201 14	2	20 00	395 81	415 81	.....	11
	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	4	110	5,332 20	2	229 31	3	.....	1,726 68	1,726 68	.....	27
	5	16	423 07	2	134 37	.....	.....	522 10	522 10	.....	9
	6	65	3,311 05	7	25 57	.....	19 07	807 96	816 96	10 07	57
	7	100	3,554 15	5	129 39	24	.....	1,636 81	1,636 81	.....	98
Peel .....	1	93	4,227 16	9	343 48	6	.....	1,254 44	1,254 44	.....	83
	2	54	3,145 77	7	604 72	6	37 67	1,899 45	1,876 57	22 97	48
	3	36	2,012 41	5	198 07	1	.....	791 83	791 83	.....	33
	4	22	1,199 73	4	447 17	.....	.....	906 34	906 34	.....	19
Perth .....	1	457	17,943 89	26	1,242 78	60	305 97	8,084 71	8,297 84	92 84	424
	2	133	460 06	11	442 26	27	.....	810 77	810 77	.....	168
	3	167	6,467 37	6	446 56	19	.....	1,870 47	1,870 47	.....	158
	4	6	277 99	12	73 49	.....	28 00	179 95	207 95	.....	4
	5	45	1,952 90	4	407 78	1	.....	1,825 00	1,825 00	.....	38
	6	171	6,831 86	24	443 17	36	.....	4,024 08	4,024 08	.....	152
Peterborough....	1	491	16,626 35	13	612 85	127	244 67	7,419 45	7,357 05	62 40	598
	2	56	1,436 85	.....	.....	2	61 37	775 32	828 69	53 37	51
	3	69	2,032 95	7	262 85	3	30 25	1,297 60	1,286 92	40 93	67
	4	5	268 81	.....	.....	.....	.....	19 60	19 60	.....	5
	5	114	5,068 35	9	478 06	2	30 00	1,807 41	1,837 41	.....	78
	6	7	215 56	.....	.....	.....	.....	56 71	56 71	.....	2
Prescott and Russell .....	1	29	1,191 66	4	121 54	6	.....	415 90	415 90	.....	27
	2	71	2,489 31	.....	.....	.....	.....	982 54	982 54	.....	4
	3	27	914 85	.....	.....	2	7 65	683 23	673 23	17 65	27
	4	95	3,538 56	1	123 19	5	.....	1,594 83	1,594 83	.....	88
	5	22	783 41	3	.....	.....	37 23	423 35	386 19	74 50	22
	6	120	6,625 91	14	759 94	4	.....	3,710 07	3,690 86	19 21	101
	7	238	4,593 66	.....	.....	60	19 86	2,400 36	2,400 36	.....	294
	8	25	1,114 52	1	.....	2	.....	379 49	379 49	.....	21
	9	29	1,351 05	.....	.....	2	15 00	1,006 27	1,021 27	.....	27
	10	151	5,292 56	7	251 43	25	.....	2,407 01	2,358 65	48 36	142
	11	184	7,805 71	15	733 54	5	.....	3,651 43	3,648 43	3 00	162

## A.—Continued.

to the 31st day of December, A.D. 1913, inclusive, etc.—Continued.

Number of suits entered where claim does not exceed \$200.	Number of actions for tort, where the amount claimed does not exceed \$50.	Number of personal actions, where the parties consent thereto in writing and the amount claimed does not exceed \$100.	Number of actions of replevin, where the value of the goods or other property or effects distrained, taken or detained, does not exceed the sum of \$50.	Number of suits entered for claims not exceeding \$10.	Number of jury trials by juries summoned.	Amount paid to jurors summoned.	Number of Jury Trials by Jurors called in pursuance of Section 142, D.C.A.	Amount payable to County Treasurer for "Division Court Jury Fee Fund."	Amount of fees and emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' fees.	The amount of costs so taxed.	Return of judgment debtors ordered to be committed.	The number of such debtors actually committed.	Clerk's returns of emoluments.	Bailiff's returns of emoluments.	Unclaimed moneys in pursuance of Section 43, D.O.A.
						\$ c.		\$ c.			\$ c.			\$ c.	\$ c.	
12				59				57			5 00	4		448 85	443 12	
3				13				17				2		141 81	108 18	
17	1			34	1	14 80		18						78 54	113 00	
3			1	5	1	9 00		70				1	1	334 99	215 45	
1								63						221 02	162 24	
								82						61 28	*43 79	
														64 75	36 68	
83			3	306	2	32 80		92		3	15 00	24	1	1,741 20	1,228 71	
3			1	16	1	11 00		74		1	5 00			121 60	102 17	
3	25			5										69 26	100 00	
22	1			63				03				1		369 75	296 20	
10				113	2	27 10		96		5	19 00	8		642 35	302 72	
1				52		33 00		67				3		456 50	349 72	
				8				64						46 64	13 22	
10	1			39										310 85		
				1										39 20		
															30 34	
2				9						1	10 00			210 47		
8	1			4										28 30	63 05	
1				26										129 50	135 55	
														230 37	161 49	
10	2			20				48						223 85	151 56	
6	2			4				51		1	10 00			167 80	73 45	
2			1	2	1	25 00		71						58 80	82 95	
3				2				25						62 54	48 08	
29				110	2	48 00		68		4	30 00	15	4	1,106 40	679 74	
6				26				37				16	1	331 83	232 55	
14				52				13				9		355 25	196 46	
1				1										18 50		
6				13				10						89 30	82 57	
19				45				97				4		408 10	280 18	
20				133	3	32 00		91				7	1	1,032 08	548 14	
5				10	2	23 00		70				1		73 90		
2				19				55						164 00	99 04	
	1			22				18						18 24		
14				22				63		3	15 00	1		260 20	163 38	
1				1				31						6 83	22 70	
2			5					95				4		68 66	42 29	
4				18				14				5		135 36	87 40	
2				9				01				1		58 45	44 14	
6								43						219 11	107 49	
				5				57						41 72		
15	1			9				12		1	5 00			276 64	164 86	
4				108				24		4	21 00	13		475 00	184 88	
4				5				39						48 95	52 41	
2	3			3				16						70 25	61 55	
9				35				07				4		364 60	219 84	
22	3			24				62						386 44	293 70	



TABLE

## Return of Division Court Business from the 1st day of January

Name of County, United Counties, or District.	Number of Divisions.	Number of suits entered exclusive of transcripts of judgments and judgment summonses.	Amount of claims entered exclusive of transcripts of judgments and judgment summonses.	Number of transcripts of judgments received from other Courts.	Amount of claims received by transcripts of judgments from other Courts.	Number of judgment summonses issued.	Balance of cash in Court from the previous year.	Total amount of suitors' money paid into Court.	Total amount of suitors' money paid out of Court.	Balance of cash in Court.	Number of suits entered where the amount claimed does not exceed \$100, exclusive of transcripts of judgments from other Courts.
			\$ c.		\$ c.		\$ c.	\$ c.	\$ c.	\$ c.	
Prince Edward..	1	496	10,205 33	2	24 19	203	261 49	3,320 38	3,325 75	256 10	687
	2	4	107 37	.....	.....	6	.....	16 67	46 67	.....	7
	3	2	32 00	.....	.....	.....	.....	17 00	17 00	.....	2
	4	4	64 31	.....	597 87	1	.....	267 05	267 05	.....	4
	5	29	904 50	.....	4 50	2	20 43	359 77	367 77	12 43	28
	6	13	556 70	.....	44 14	3	2 00	174 34	174 34	2 00	12
	7	8	175 86	.....	41 75	3	.....	21 82	21 82	.....	11
	8	No suits entered	on	during	the	year.	.....	.....	.....	.....	.....
Rainy River ...	1	238	10,606 01	6	273 12	3	516 62	7,826 53	7,464 62	878 53	201
	2	47	3,022 31	16	206 08	2	.....	1,202 90	1,202 90	.....	43
	3	46	2,500 05	4	249 56	.....	257 30	1,164 38	1,228 93	192 75	41
Renfrew .....	1	188	7 016 15	4	57 53	12	158 46	1,836 56	1,768 70	226 32	190
	2	12	490 41	1	51 41	.....	.....	356 73	356 73	.....	12
	3	150	5,490 54	12	592 07	3	206 73	2,636 71	2,791 10	53 70	139
	4	180	5,930 06	7	324 07	16	198 61	3,035 22	2,995 44	238 39	168
	5	104	3,353 76	3	303 67	24	.....	2,099 19	1,931 30	77 89	100
	6	77	2,958 22	10	489 08	11	91 22	2,111 51	2,104 51	98 22	70
	7	89	3,088 21	3	274 25	1	89 98	1,504 00	1,480 70	23 30	88
Simcoe.....	1	677	23,202 69	14	877 65	34	85 57	9,922 90	9,938 60	69 87	681
	2	111	3,615 33	3	332 15	25	100 46	1,729 91	1,652 05	178 32	104
	3	60	2,457 67	4	.....	5	7 00	1,063 86	898 51	172 35	51
	4	177	6,403 77	9	398 64	3	339 41	2,098 98	2,278 68	159 71	82
	5	50	2,449 98	3	96 75	3	46 00	1,688 45	1,695 82	38 63	35
	6	383	12,727 46	13	739 37	45	207 18	5,134 38	4,915 39	218 99	243
	7	34	1,392 49	3	141 87	1	.....	677 54	677 54	.....	230
	8	105	6,766 30	11	957 37	7	123 39	2,584 04	2,468 08	238 35	94
	9	581	15,249 86	10	689 86	46	67 11	9,122 49	85,967 57	222 03	559
	10	168	6,051 69	12	487 34	18	102 33	1,817 66	1,850 07	69 92	157
Stormont, Dundas and Glengarry	1	75	3,664 87	1	40 34	9	95 35	1,547 65	1,547 65	.....	64
	2	248	3,868 91	1	50 00	82	254 50	1,999 74	1,967 93	51 81	238
	3	290	9,438 11	7	259 35	77	189 47	4,390 82	4,405 76	174 53	273
	4	47	1,920 43	8	494 47	5	.....	618 05	603 05	15 00	43
	5	98	3,280 47	1	32 42	23	79 77	1,259 48	1,168 18	171 07	116
	6	45	1,872 35	6	232 11	3	20 00	407 27	427 27	.....	43
	7	39	1,392 80	3	243 21	3	34 55	725 84	719 64	40 75	37
	8	99	4,648 35	2	140 42	13	93 10	2,462 35	2,419 11	43 24	87
	9	55	1,428 33	.....	.....	.....	.....	490 21	490 21	.....	51
	10	129	4,975 85	8	376 99	16	71 34	2,746 40	2,594 63	223 11	117
	11	30	1,805 21	3	125 23	3	5 61	630 60	620 60	10 00	27
	12	60	2,738 45	6	417 71	7	38 79	1,512 61	1,507 32	5 29	52
Sudbury .....	1	1,116	48,151 00	42	3,489 00	12	2,697 30	20,320 00	20,562 20	2,465 10	1,028
	2	76	3,424 06	4	161 22	4	274 85	1,173 75	1,603 05	70 70	66
	3	134	5,672 53	10	327 82	1	253 77	1,887 34	1,994 21	146 90	124
	4	52	2,901 38	5	447 57	2	.....	1,156 81	1,156 81	.....	41
	5	430	17,687 21	22	585 11	16	277 58	8,535 22	7,965 85	846 95	331
Thunder Bay....	1	933	38,807 15	29	2,008 22	71	331 87	18,591 67	18,225 56	366 06	821
	2	1,052	55,153 72	34	2,502 42	52	2,075 40	18,358 99	18,034 97	2,399 42	977



## A.—Continued.

to the 31st day of December, A.D. 1913, inclusive, etc.—Continued.

Number of suits entered where claim does not exceed \$500.	Number of actions for tort, where the amount claimed does not exceed \$50.	Number of personal actions, where the parties consent thereto in writing and the amount claimed does not exceed \$100.	Number of actions of replevin, where the value of the goods or other property or effects distrained, taken or detained, does not exceed the sum of \$50.	Number of suits entered for claims not exceeding \$10.	Number of jury trials by juries summoned.	Amount paid to jurors summoned.	Number of jury trials by jurors called in pursuance of section 142, D.C.A.	Amount payable to County Treasurer for "Division Court Jury Fee Fund."	Amount of fees and emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' fees.	The amount of costs so taxed.	Return of judgment debtors ordered to be committed.	The number of such debtors actually committed.	Clerk's returns of emoluments.	Bailiff's returns of emoluments.	Unclaimed moneys in pursuance of section 45, D.C.A.
14	9			278		\$ c.		\$ c.	\$ c.	1	\$ c.	6		\$ c.	\$ c.	\$ c.
2	2							5 28			5 00			1,176 00	417 18	
1	24			11				9						17 34		
1				2				06						3 70	3 71	
				2				73						23 11	19 08	
				2				55						74 59	33 49	
								06						34 02	14 43	
														26 06	15 71	
														4 00		
25				3	22									493 20		1 60
5				1	5									90 55		
5					1									92 00		
10	7			30				5 47						325 85	196 51	
11				3				39						30 00	20 93	
12				40				5 03		1	10 00			243 75	304 34	
4				47				5 64						410 30	151 34	
4				23				2 07				3	1	224 70	220 33	
4				9				2 93		1	5 00	1		190 11	99 47	fine \$5
4				13				2 17						185 80	175 44	
30				168				19 68				17		1,513 13	283 55	
6				22				3 33		1	5 00	6	1	278 40	163 98	
11				8				3 15				3	1	140 10	96 06	
7				47				5 99				3		335 50	262 69	
33				8				2 65				2		106 50	121 75	
3				107	1	10 00		16 25		2	15 00	9		877 50	304 70	
8				2				1 53		1	5 00			65 90	122 63	
21				15				4 43		4	25 00	3		254 15	187 86	
11				204				13 63		1	5 00	23	1	1,284 25	1,044 05	
				38	2	15 80		5 90		1	5 00	2		356 15	250 17	
11																
16				1	12			4 01		1				150 17	166 31	
18					216			8 91			5 00			448 81	385 09	
17					91			8 75		2	13 00	19	3	749 35	329 81	
3					10			1 81		1	6 00	5		141 04	138 80	
4					27			3 12						239 25	135 30	
2					6			1 49						151 22	60 00	
2					13			1 31				3		91 60		
11					13			4 24						201 25	141 77	
4					23			4 51						88 62	34 70	
9					31			4 82						231 75	230 62	
3					2			1 47						74 85	168 44	
8					9	1	11 75	3 23		1	7 00	4		137 10	141 56	
88	2			1	134									1,847 05	1,932 13	22 00
5					5							4		198 40	178 00	
10	3				26									252 69		24 96
8					3									124 93	109 48	
29	1				61							2		825 05	617 37	
101					111				44 68			4		2,223 43	26 06	
127	7			1	99					11	81 00	7		1,869 93	919 80	

\*Part of year only.

2 D.C.

TABLE

Return of Division Court Business from the 1st day of January

Name of County, United Counties, or District.	Number of Divisions.	Number of suits entered exclusive of transcripts of judgments and judgment summonses.	Amount of claims entered exclusive of transcripts of judgments and judgment summonses.	Number of transcripts of judgments received from other Courts.	Amount of claims received by transcripts of judgments from other Courts.	Number of judgment summonses issued.	Balance of cash in Court from the previous year.	Total amount of suitors' money paid into Court.	Total amount of suitors' money paid out of Court.	Balance of cash in Court.	Number of suits entered where the amount claimed does not exceed \$100, exclusive of transcripts of judgments from other Courts.
			\$ c.		\$ c.		\$ c.	\$ c.	\$ c.	\$ c.	
Victoria .....	1	20	905 92	2	87 37	.....	.....	509 05	509 05	.....	19
	2	33	1,233 75	4	203 51	3	.....	751 96	751 96	.....	31
	3	60	1,696 57	1	19 78	4	3 00	510 43	513 43	.....	60
	4	15	390 00	1	18 10	2	.....	231 31	231 31	.....	15
	5	282	9,433 93	9	620 74	33	25 70	3,647 85	3,649 75	23 80	304
	6	29	1,404 07	1	30 05	3	3 75	481 07	484 82	.....	23
	7	31	1,084 58	4	149 73	1	39 57	522 64	462 05	60 59	31
Waterloo .....	1	734	19,875 30	24	1,170 47	143	104 85	10,562 32	10,494 87	87 46	558
	2	147	3,003 85	11	430 58	9	18 86	2,183 09	2,171 11	11 98	144
	3	482	12,929 75	20	912 53	121	21 43	5,447 40	5,481 83	17 00	470
	4	110	3,669 74	11	944 81	14	271 90	1,844 61	2,001 51	113 00	106
	5	67	2,068 68	7	221 97	8	2 50	1,698 40	1,640 87	.....	70
	6	46	1,856 89	2	15 02	4	.....	754 16	754 16	.....	41
	7	9	511 46	.....	.....	.....	.....	240 75	168 12	72 63	7
Welland .....	1	559	15,551 47	27	1,299 56	136	495 88	7,592 85	7,520 16	568 57	352
	2	23	1,285 72	5	217 32	7	14 00	522 53	525 55	10 97	19
	3	195	5,961 83	19	1,183 61	16	18 71	2,685 06	2,693 31	10 46	173
	4	317	11,191 41	25	1,229 39	54	251 14	4,754 91	4,264 68	490 23	295
	5	71	2,625 04	6	566 34	13	59 10	1,507 09	1,521 81	44 38	68
	6	87	2,424 37	5	159 42	4	3 22	1,256 72	1,259 94	.....	86
Wellington .....	1	700	20,805 19	23	1,721 39	93	18 21	11,388 23	11,378 41	28 03	663
	2	7	163 57	4	238 79	.....	.....	210 69	210 69	.....	7
	3	17	418 36	2	226 51	.....	.....	285 44	281 94	3 50	17
	4	65	2,504 36	3	99 84	2	16 00	889 91	895 91	10 00	58
	5	28	1,468 66	6	414 32	3	.....	637 17	633 02	4 15	23
	6	46	1,393 41	9	166 29	6	114 90	922 34	1,007 24	30 00	.....
	7	81	1,994 72	13	936 77	15	25 00	2,410 77	2,402 77	33 00	45
	8	52	2,321 93	11	387 00	9	107 83	1,580 78	1,643 66	54 95	48
	10	75	2,694 75	11	709 57	4	124 72	1,097 67	1,001 86	220 53	71
	11	47	2,350 73	5	418 00	5	226 83	1,424 45	1,447 08	214 20	40
Wentworth .....	1	1,235	48,918 06	22	1,370 23	57	341 21	14,400 32	14,342 52	399 01	1,178
	2	126	4,465 19	9	378 60	4	.....	2,626 17	2,626 17	.....	120
	3	16	789 04	6	753 63	1	.....	709 96	709 97	.....	15
	4	47	2,377 42	5	202 60	.....	.....	1,576 57	1,576 57	.....	43
	5	121	3,298 45	7	300 87	1	.....	1,223 22	1,238 32	.....	121
	6	vacant	.....	.....	.....	.....	.....	.....	.....	.....	.....
	7	1	100 80	.....	.....	.....	.....	.....	.....	.....	.....
	9	1,656	57,435 97	40	1,896 03	50	488 68	21,618 44	21,823 58	283 54	1,651
York .....	1	5,562	261,277 43	99	5,289 67	625	2,289 27	53,634 67	53,080 09	2,843 85	5,205
	2	93	3,840 25	16	881 68	3	24 45	1,919 95	1,944 40	.....	53
	3	51	1,854 14	6	356 82	.....	.....	1,420 81	1,455 48	.....	49
	4	147	4,656 59	24	1,348 48	.....	.....	3,203 67	3,231 11	.....	134
	5	52	2,775 68	8	644 90	3	.....	1,531 19	1,555 81	88 40	50
	6	91	4,289 13	1	144 84	2	123 02	1,815 68	1,841 68	3 91	81
	7	37	2,545 66	5	181 43	4	.....	1,872 06	1,741 26	131 40	28
	8	777	30,957 17	61	3,771 73	115	129 86	10,724 13	10,421 94	432 05	724
	9	31	1,646 18	6	407 36	2	57 52	773 80	830 82	.....	29
	10	3,993	189,099 28	91	5,504 47	415	1,184 86	41,104 11	40,316 09	1,972 58	3,639
Totals .....	339	63,675	2,433,162 82	3,062	160,147 72	7,173	36,846 05	100,288 36	961,924 42	39,734 90	56,546

## A.—Concluded.

to the 31st day of December, A.D. 1913, inclusive, etc.—Concluded.

Number of suits entered where claim does not exceed \$200.	Number of actions for tort, where the amount claimed does not exceed \$60.	Number of personal actions, where the parties consent thereto in writing and the amount claimed does not exceed \$100.	Number of actions of replevin, where the value of the goods or other property or effects distrained, taken or detained, does not exceed the sum of \$60.	Number of suits entered for claims not exceeding \$10.	Number of jury trials by juries summoned.	Amount paid to jurors summoned.	Number of jury trials by jurors called in pursuance of section 142, D.C.A.	Amount payable to County Treasurer for "Division Court Jury Fee Fund."	Amount of fees and emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' fees.	The amount of costs so taxed.	Return of judgment debtors ordered to be committed.	The number of such debtors actually committed.	Clerk's returns of emoluments.	Bailiff's returns of emoluments.	Unclaimed moneys in pursuance of Section 43, D.C.A.
						\$ c.		\$ c.			\$ c.			\$ c.	\$ c.	
1								76						42 24	31 11	
3								1 41						79 29	62 20	
4								1 56				1		121 35	91 38	
10	5							27						34 22	28 23	
1	1							7 55				9		624 70	227 80	
1								1 32						77 70	49 03	
1								85						50 50		
24			1	196	1	12 00		14 98				23		1,655 94	708 80	
3				64				1 86						304 55		
12				195				9 57	1	5 00		17		1,091 60	358 49	
3	1		1	31				2 87				2		224 92		
5	2			21				2 21				1		139 15	167 78	
5				10				2 00				1		120 00	100 00	
2				2				62						18 94	8 66	
23			1	85				12 76				26	5	1,391 25	727 99	
4				4				1 45				2		76 35	82 08	
4				38				4 39				1		404 15	467 00	
21	1		3	59				10 93	2	15 00		14		767 90	401 40	
3				13				2 43				3		178 62	106 74	
1				30				1 72						172 50	83 22	
37	2		2	221				17 68		4	35 00	27	2	1,687 50	454 92	
				2				15						20 92	6 73	
				4				27						28 55		
7				22				2 80						149 15	78 65	
5				6				1 76				1		78 76	59 79	
				10				93				1	1	97 30	60 52	
8	4			24				3 23				2		220 25	146 68	
4	2			8				2 08						152 72	110 89	
3				14				2 19						163 70	6 73	5 10
6	1			6				2 49						132 90	106 64	3 45
57	21		1	241	1	7 00		34 45	60 55	12	70 00	16		2,302 75	1,316 60	
10	4			26				4 66				1		292 95	252 36	
7				2				2 79						65 42	62 75	
1	1			8	3	25 00		1 90						119 17	132 26	
1	1			29				2 32		1	3 00			214 35		
								25						4 34	7 35	
75	17		1	389	3	31 00		48 96	241 85	4	25 00	14		3,209 95	1,564 01	
357	101		7	800	1	12 00		214 65	1,281 96	37	185 00	224		8,409 80	5,716 28	18 44
7				18	1	12 00		3 79						237 10		
2	1			14				1 58						114 15	91 02	
10				39				4 81				5		336 05	396 88	
5	1			4				2 66						140 29	89 94	
10				16										187 25		
13				3				3 35						119 84	70 46	
46	11		1	171				28 37				29		1,594 60	1,125 25	
2				1				1 40				1		56 30		
325	84			751				171 00	964 02	28	140 00	115		6,820 11	5,647 32	16 59
4,150	636	13	113	14,520	115	1,214 50	2	1,835 69	4,030 84	240	1,428 00	1,488	46			111 96

\* Part of year only.



TABLE B.

LIST of Division Court clerks, their post office address, their county or district and number of division in which their Courts are situated, for the Province of Ontario, up to the 31st December, 1913, inclusive. (Lists corrected up to date of printing.)

County and District.	No. of Division.	Clerk.	Post office address.
Algoma.....	1	F. A. King.....	Sault Ste. Marie
	2	T. Sullivan.....	Bruce Mines
	3	Thos. Dodds.....	Thessalon
	6	W. F. Adams.....	Richard's Landing
	7	H. F. G. Dreyer.....	Blind River
Brant.....	1	James C. Spence.....	Brantford
	2	Jas. Smiley.....	Paris
	3	S. B. Laurason.....	St. George
	4	W. F. Miles.....	Burford
	5	Walter E. Hooker.....	Scotland
Bruce.....	1	N. Crawford.....	Walkerton
	2	John K. McLean.....	Teeswater
	3	Joseph Barker.....	Kincardine
	4	J. C. Gibson.....	Paisley
	5	J. A. Chapman.....	Port Elgin
	6	A. Nelson.....	Tiverton
	7	J. R. Vandusen.....	Tara
	8	J. H. Fielding.....	Warton
	9	Angus Martyn.....	Ripley
	10	John Pettigrew.....	Lion's Head
	11	W. J. Little.....	Lucknow
	12	C. E. Biehn.....	Chesley
Carleton.....	1	J. R. Armstrong.....	Ottawa
	2	Wm. McElroy.....	Richmond
	3	Jas. H. Wilson, Jr.....	Carp
	4	Matthew Riddell.....	Galetta
	5	John Kerr.....	North Gower
	6	W. C. Cameron.....	Metcalf
	7	W. A. Mason.....	Ottawa
Dufferin.....	1	T. J. M. Bennett.....	Orangeville
	2	W. H. Lamon.....	Shelburne
	3	John Ferris.....	Stanton
	4	Robt. Orr.....	Mono Mills
	5	W. A. Wansborough.....	Grand Valley
Elgin.....	1	E. C. Monteith.....	Aylmer
	2	John McIntyre.....	St. Thomas
	3	John McIntyre.....	St. Thomas
	4	Samuel Maccoll.....	Dutton
Essex.....	1	C. F. Pequegnot.....	Sandwich
	2	G. E. Pulford.....	Amherstburg
	3	Geo. Pearce.....	Kingsville
	4	C. Bell.....	Oxley
	5	W. G. Gidley.....	Leamington
	6	H. Taylor.....	Belle River
	7	Joseph D. A. Deziel.....	Windsor
	8	Wm. Laing.....	Essex
	9	A. J. Brown.....	Comber
	10	L. D. Warner.....	Pele Island



## List of Division Court Clerks.—Continued.

County and District.	No. of Division.	Clerk.	Post office address.
Frontenac .....	1	W. H. Carson .....	Kingston
	2	J. F. Latherland .....	Cataraqui
	3	J. W. Davis .....	Sydenham
	4	H. McMullen .....	Verona
	5	H. Kieler.....	Battersea
	6	E. B. Buell .....	Sharbot Lake
	7	W. McGregor .....	Arden
Grey .....	1	A. C. Maitland.....	Owen Sound
	2	Archibald Davidson ....	Durham
	3	H. P. Heming .....	Meaford
	4	W. L. Tyson .....	Clarksburg
	5	W. J. Bellamy .....	Flesherton
	6	G. W. Collins .....	Chatsworth
	7	John Taylor .....	Hanover
	8	Richard L. Stephen ....	Markdale
Haldimand .....	1	James McGregor .....	Caledonia
	2	B. Humphrey .....	Cayuga
	3	T. Armour.....	Dunnville
	4	C. E. Bourne.....	Jarvis
	5	Robert E. Johnson.....	Canboro'.
Haliburton .....	1	Geo. A. Rogers .....	Minden
	2	G. Bemister .....	Haliburton
	3	Stephen Kettle.....	Ursa
	4	Ed. B. Speers.....	Dorset
Halton .....	1	Wm. Panton .....	Milton
	2	A. Hillmer .....	Oakville
	3	C. C. Roe .....	Georgetown
	4	Geo. Agnew.....	Acton
	5	Wm. Fraser.....	Campbellville
	6	J. A. McArthur.....	Burlington
Hastings ... ..	1	F. M. Clarke .....	Belleville
	2	W. Greer .....	St. Ola
	3	L. E. Mills .....	Shannonville
	4	F. A. Bartlett.....	Tweed
	5	Thomas G. Clute .....	Stirling
	6	Dennis Gillen .....	Madoc
	7	Thos. Donnelly.....	Deseronto
	9	C. W. London .....	Trenton
	10	J. C. Bowen.....	Marmora
	11	James Haryatt.....	Maynooth
	12	W. N. Simmons .....	Bancroft
Huron.....	1	James Yates.....	Goderich
	2	J. C. Greig.....	Seaforth
	3	H. T. Rance .....	Clinton
	4	S. Wilson.....	Brussels
	5	R. N. Creech.....	Exeter
	6	James Whyard.....	Dungannon
	7	Jno. Tippet .....	Bayfield
	8	C. N. Griffin .....	Wingham
	9	Thomas Brown .....	Wroxeter
	10	W. L. Siebert .....	Zurich
	11	Wm. Lewis .....	Crediton
	12	Thos. Code .....	Blyth

## List of Division Court Clerks.—Continued.

County and District.	No. of Division.	Clerk.	Post office address.
Kenora .....	1	O. Partington.....	Kenora
	2	Fred Deacon .....	Wabigoon
	3	A. L. Orvis .....	Dryden
	4	P. B. Discher.....	Sioux Lookout
Kent .....	1	W. B. Wells .....	Chatham
	2	Arthur McKinlay .....	Ridgetown
	3	C. E. Osteshout .....	Dresden
	4	J. W. Gibson .....	Blenheim
	5	Charles B. Jackson .....	Wallaceburg
	6	Jos. Dillon .....	Bothwell
	7	Arthur A. Wilson .....	Tilbury
Lambton.....	1	A. F. Wade .....	Sarnia
	2	Wm. McLeay .....	Watford
	3	Jas. McIntyre .....	Florence
	4	Wm. W. Stover.....	Sombra
	5	Thomas L. Jones .....	Forest
	6	W. C. Tudor .....	Thedford
	7	John McCrea.....	Mooretown
	8	W. G. Fraser.....	Petrolia
	9	Richard Code .....	Alviston
Lanark .....	1	R. Jamieson .....	Perth
	2	T. L. Simpson.....	Lanark
	3	A. R. G. Peden .....	Carleton Place
	4	James H. Ross .....	Smith's Falls
	5	P. C. Dowdall.....	Almonte
Leeds and Grenville. ....	1	I. J. Mansell.....	Brockville
	2	Jno. F. Graham.....	Prescott
	3	S. McCammon.....	Gananoque
	4	S. J. Law.....	Kemptville
	5	W. H. McCrea.....	Merrickville
	6	N. L. Phelps .....	Delta
	7	Jas. Edgar .....	Toledo
	8	Ed. Wright .....	Newboro'
	9	E. J. Purcell.....	Athens
	10	M. Maguire.....	Spencerville
	11	John Haley .....	North Augusta
	12	Charles Tennant .....	Mallorytown
Lennox and Addington ..	1	A. Knight.....	Napanee
	2	Fred W. Armstrong .....	Bath
	3	Joseph B. Allison .....	Adolphustown
	4	Jno. H. Patterson.....	Newburgh
	5	Miss B. Cox.....	Enterprise
	6	J. A. Timmerman .....	Odessa
	7	James Aylesworth.....	Tamworth
	8	J. M. Dafee.....	Flinton
	9	W. J. Slater.....	Denbigh
Lincoln.....	1	Samuel Shearer.....	Niagara-on-the-Lake
	2	A. H. Trapnell.....	St. Catharines
	3	Thos. Pearson .....	Smithville
	4	W. D. Fairbrother .....	Beamsville
	5	R. T. Johnson .....	Grimsby
Manitoulin .....	1	A. Hall.....	Gore Bay
	2	David McGilvery.....	Little Current
	3	W. A. Beatty .....	Manitowaning

## List of Division Court Clerks.—Continued.

County or District.	No. of Division.	Clerk.	Post office address.
Middlesex .....	1	J. W. McIntosh .....	London
	2	Wm. J. McRoberts .....	Parkhill
	3	R. H. Collins .....	Lucan
	4	J. H. Matthews .....	Delaware
	5	G. Wilson .....	Glencoe
	6	John H. McIntosh .....	Strathroy
	7	Edward Thomas Shaw.	Dorchester Station
	8	Walter R. Westlake....	Arva
	9	F. H. Whetter.....	London
Muskoka .....	1	Alfred Hunt. ....	Bracebridge
	2	W. N. Moody .....	Gravenhurst
	3	A. R. Corbett .....	Huntsville
	4	F. D. Stubbs.....	Port Carling
Nipissing.....	1	A. W. Smith .....	Sturgeon Falls
	2	John McMeekin .....	Mattawa
	3	M. W. Flannery.....	North Bay
	5	J. A. Levesque .....	Bonfield
Norfolk.....	1	E. E. Collins.....	Simcoe
	2	Abraham A. Tobin....	Waterford
	3	Hy. McKnight .....	Teeterville
	4	Arthur Gerhard.....	Delhi
	5	M. J. McColl.....	Vittoria
	6	Arthur P. Barrett.....	Port Rowan
	7	Watson Park .....	Fairground
	8	W. Francis Tibbetts....	Port Dover
Northumberland and Durham .....	1	John Moorecraft.....	Bowmanville
	2	L. B. Davidson.....	Newcastle
	3	Thos. A. Thompson....	Port Hope
	4	W. S. Givens .....	Millbrook
	5	J. C. Rosevear .....	Cobourg
	6	E. H. Pratt .....	Grafton
	7	H. S. Keyes.....	Colborne
	8	B. C. H. Becker.....	Brighton
	9	P. S. Ewing .....	Warkworth
	10	Wm. Little .....	Wooler
	11	S. J. Fisher.....	Campbellford
Ontario .....	1	Miss E. L. McDonell...	Whitby
	2	M. Gleeson .....	Greenwood
	3	J. W. Burnham.....	Port Perry
	4	R. J. Moore.....	Uxbridge
	5	Thos. Foster.....	Cannington
	6	C. A. Patterson.....	Beaverton
	7	D. Leonard .....	Atherly
Oxford .....	1	V. L. Francis.....	Woodstock
	2	Chas. K. Curry.....	Drumbo
	3	E. J. Cody .....	Embro
	4	M. L. Bushell.....	Norwich
	5	Neil G. Gunn .....	Ingersoll
	6	John C. Ross.....	Tillsonburg
	7	W. S. Russell.....	Tavistock

## List of Division Court Clerks.—Continued.

County or District.	No. of Division.	Clerk.	Post office address.
Parry Sound.....	1	W. J. Jones.....	Parry Sound
	2	John Fletcher.....	McKellar
	3	.....	Rosseau
	4	Fred Metcalf.....	Burk's Falls
	5	Harry Snuggs.....	Magnetawan
	6	T. J. Williams.....	Powassan
	7	John Harper.....	Sundridge
Peel ... ..	1	John Clarke.....	Brampton
	2	H. H. Shaver.....	Cooksville
	3	M. C. Hillock.....	Caledon
	4	John McDonald.....	Bolton
Perth.....	1	D. B. Burritt.....	Stratford
	2	J. Dougherty.....	Mitchell
	3	Richard Shepherd.....	St. Mary's
	4	Jos. Thompson.....	Shakespeare
	5	Wm. Zimmerman.....	Milverton
	6	Wm. Bright.....	Listowel
Peterborough.....	1	J. W. Miller.....	Peterborough
	2	J. L. Squires.....	Norwood
	3	W. Sherin.....	Lakefield
	4	Chas. Booth.....	Apsley
	5	W. A. McMaster.....	Havelock
	6	W. D. Edwards.....	Keene
Prescott and Russell.....	1	E. A. Johnson.....	L'Orignal
	2	P. S. Paquet.....	Vankleek Hill
	3	Napoleon Labrosse.....	St. Eugene
	4	D. Viau.....	Plantagenet
	5	H. B. Cameron.....	Cumberland
	6	A. Carson.....	Russell
	7	J. A. D. Landriault ..	Hawkesbury
	8	R. L. Downing.....	Routhier
	9	F. W. Langrell.....	Alfred
	10	W. Thievierge.....	Clarence Creek
	11	Peter Stewart.....	South Indian
Prince Edward.. ..	1	Fred Slavin.....	Pieton
	2	J. McQuoid.....	Milford
	3	Charles H. Wright.....	Demorestville
	4	W. H. C. Roblin.....	Ameliasburg
	5	H. A. Jolley.....	Wellington
	6	C. H. Saylor.....	Bloomfield
	7	A. S. Burr.....	Consecon
	8	B. E. Harrison.....	Waupoos
Rainy River....	1	W. H. Elliott.....	Fort Frances
	2	Robert Gill.....	Emo
	3	D. K. McGregor.....	Rainy River
Renfrew.. ..	1	J. H. Leach.....	Pembroke
	2	Hugh S. Miller.....	Beachburg
	3	M. Devine.....	Renfrew
	4	John R. Tierney.....	Arnprior
	5	J. A. P. Haydon.....	Eganville
	6	J. R. Warren.....	Cobden
	7	P. J. Harrington.....	Killaloe Station



## List of Division Court Clerks.—Continued.

County or District.	Nc. of Division	Clerk.	Post office address.
Simcoe .....	1	W. C. McLean .....	Barrie
	2	R. E. Stevenson.....	Bradford
	3	Jos. Wright.....	Beeton
	4	George Moberley.....	Collingwood
	5	T. C. Craig.....	Craighurst
	6	F. Webber.....	Orillia
	7	W. Muir.....	New Lowell
	8	D. A. Lee.....	Alliston
	9	W. J. Martin.....	Penetanguishene
	10	J. R. Russell.....	Coldwater
Stormont, Dundas and Glengarry .....	1	J. A. B. McLennan.....	Williamstown
	2	Hugh R. McDonald .....	Alexandria
	3	G. A. Milden.....	Cornwall
	4	Geo. Sampson.....	Aultsville
	5	Jas. N. Eastman.....	Morrisburg
	6	Jas. Collison .....	Iroquois
	7	M. J. Cleland.....	South Mountain
	8	J. W. Carr.....	Finch
	9	J. R. McLeod.....	Dalhousie Station
	10	W. G. Bolster.....	Chesterville
	11	D. McIntosh .....	Strathmore
	12	John D. McIntosh .....	Dominionville
Sudbury.....	1	J. K. McLennan.....	Sudbury
	2	J. A. Bastien.....	Chelmsford
	3	J. C. McMillan.....	Webbwood
	4	S. Soufrine .....	Warren
Temiskaming.....	1	Paul A. Cobbold.....	Haileybury
	2	F. W. Ferguson.....	Liskeard
	3	Samuel Errett.....	Englehart
	4	A. Skill.....	Elk Lake
	5	G. A. D. Murray.....	South Porcupine
	6	S. L. Bradley.....	Cochrane
Thunder Bay .....	1	R. E. Mitchell .....	Port Arthur
	3	G. H. Coe.....	Fort William
Victoria.. ..	1	Arch. Campbell .....	Woodville
	2	Edward D. Hand .....	Fenelon Falls
	3	G. W. Taylor .....	Bobcaygeon
	4	W. H. Kennedy.....	Omeme
	5	Elias Bowes.....	Lindsay
	6	J. F. Cunnings .....	Oakwood
	7	A. C. Graham.....	Victoria Road
Waterloo .....	1	Fred. Rohleder.....	Berlin
	2	James D. Webster.....	Preston
	3	Edward D. Wilkins.....	Galt
	4	F. H. McCallum.....	New Hamburg
	5	C. W. Parsill .....	Linwood
	6	Wm. H. Winkler .....	St. Jacob's
	7	A. E. Watson .....	Ayr

## List of Division Court Clerks.—Concluded.

County or District.	No. of Division.	Clerk.	Post office address.
Welland .....	1	John M. Livingston.....	Welland
	2	Joseph Henderson.....	Marshallville
	3	Jos. Clark .....	Ridgeway
	4	Jos. G. Cadham .....	Niagara Falls Sth.
	5	D. J. C. Munro.....	Thorold
	6	Jas. E. Neff .....	Port Colborne
Wellington .....	1	Thos. J. Day.....	Guelph
	2	Wm. Nicoll .....	Morrison
	3	Robt. Scott .....	Eramosa
	4	John Brownridge.....	Fergus
	5	A. J. Lindsay .....	Ballinafad
	6	Henry Clark.....	Elora
	7	John Lunz .....	Drayton
	8	R. T. Smith .....	Arthur
	10	C. L. Eady.....	Harriston
	11	J. C. Wilkes .....	Mount Forest
Wentworth.....	1	C. J. Jones .....	Hamilton
	2	F. D. Suter .....	Dundas
	3	J. C. Medlar.....	Waterdown
	4	H. M. McPherson.....	Orkney
	5	J. C. Moore ....	Stoney Creek
	7	G. T. Neale.....	Glanford
	8	Thomas Murphy .....	Binbrook
	9	C. H. Peebles .....	Hamilton
York.....	1	A. McL. Howard .....	Toronto
	2	Robert J. Corson ....	Markham
	3	Thos. F. McMahon.....	Richmond Hill
	4	K. N. Robertson....	Newmarket
	5	F. G. Tremayne.....	Sutton West
	6	W. H. Taylor .....	Aurora
	7	E. W. Brown .....	Woodbridge
	8	John Hamshaw.....	West Toronto
	9	J. H. Richardson .....	West Hill
	10	E. H. Duggan.....	Toronto

TABLE C.

List of Division Court Bailiffs, their Post Office Address, the County or District and Number of Division in which their Courts are situated, for the Province of Ontario, up to 31st December, 1913, inclusive. (Lists corrected up to date of printing.)

County or District.	No. of Division.	Bailiff.	Post office address.
Algoma .....	1	T. J. Bowers.....	Sault Ste. Marie
	2	O. A. Willoughby.....	Bruce Mines.
	3	Neil Curry .....	Thessalon
	6	A. Kitchen.....	Carterton, St. Jos. Is.
	7	Robt. George.....	Blind River
Brant .....	1	Jno. M. Dyckman.....	Brantford
	2	J. W. Fasken .....	Paris
	3	J. H. Cornell.....	St. George
	4	Robt. Balkwill .....	Burford
	5	J. R. Smith .....	Scotland
Bruce .....	1	Ezra Briggs .....	Walkerton
	2	Jas. Donaghy .....	Teeswater
	3	George G. Collins.....	Kincardine
	4	Alex. Fraser.....	Paisley
	5	Wm. McFadden.....	Port Elgin
	6	Gore Leggett.....	Tiverton
	7	L. G. Briggs .....	Tara
	8	H. G. Trout.....	Warton
	9	.....	Bervie
	10	A. C. Bridge .....	Lion's Head
	11	R. J. Cameron .....	Lucknow
	12	Jno. Beatty.....	Chesley
Carleton.....	1	E. Lavoie.....	Ottawa
	1	E. T. Van Nierop .....	Ottawa
	2	Jos. Binnington .....	Stapleton
	3	Wm. Falls .....	Carp
	4	George Owens.....	Antrim
	5	Wesley Hicks.....	Kars
	6	Ed. J. Murphy.....	Metcalfe
Dufferin.....	7	A. Wilson.....	Ottawa
	1	Jos. Hughes.....	Orangeville
	2	John Reburn .....	Whitfield
	3	Jno. Armstrong .....	Earnscliffe
	4	Wm. Irwin .....	Mono Mills
	5	J. I. Buchanan .....	Grand Valley
Elgin .....	1	W. W. White.....	Aylmer
	2	Geo. Smiley.....	St. Thomas
	3	Geo. Smiley.....	St. Thomas
	4	A. J. Branton .....	Dutton

## List of Division Court Bailiffs, etc.—Continued.

County or District.	No. of Division.	Bailiff.	Post office address.
Essex.....	1	Alois Master .....	Sandwich
	2	John Pettypiece.....	Amherstburg
	3	Horace Wigle.....	Kingsville
	4	R. J. Snider.....	Harrow
	5	Wm. Roach .....	Leamington
	6	.....	Belle River
	7	F. St. Louis....	Windsor
	8	James Johnston .....	Essex
	9	Leon Souchereau .....	Stoney Point
	10	H. S. Barnes.....	Pelee
Frontenac.....	1 {	Hiram Davis.....	Wolfe Island
		Chas. G. Clarke .....	Kingston
	2	.....	Cataraqui
	3	P. Trousdale.....	Sydenham
	4	E. A. Tallen.....	Verona
	5	E. F. Dennee .....	Inverary
	6 {	.....	Ardoch
Grey .....		W. Thomlison.....	Sharbot Lake
	7	John E. Hays.....	Arden
	1	Robt. Taylor.....	Owen Sound
	2	Wm. Sharp.....	Durham
	3	W. H. Arthur .....	Meaford
	4	Geo. Mitchell.....	Clarksburg
	5	John Wright, Jr.....	Flesherton
	6	James Dudgeon.....	Chatsworth
Haldimand .....	7	F. Heimbecker.....	Hanover
	8	W. J. Pickell.....	Markdale
	1	James Thorburn.....	Caledonia
	2	Robert Walker.....	Cayuga
	3	Wm. McIndoe.....	Dunnville
Haliburton .....	4	Geo. A. Irwin .....	Jarvis
	5	Harvey Ricker.....	Canboro
	1	R. C. Garrett .....	Minden
	2	.....	Haliburton
	3	J. M. Pickens .....	Ursa
Halton .....	4	Angus McKay .....	Dorset
	1	E. G. Paige .....	Milton
	2	Alex. McCleary .....	Oakville
	3	W. R. Brown .....	Georgetown
	4	John Lawson.....	Acton
	5	.....	Campbellville
Hastings .....	6	Hiram Laud .....	Burlington
	1	Joshua Duffin.....	Belleville
	2	Fred. Remington .....	St. Ola
	3	W. E. Pearsall.....	Shannonville
	4	W. H. Davis.....	Tweed
	5	Jas. Tanner.....	Stirling
	6	C. St. Charles.....	Madoc
	7	A. P. Brown .....	Deseronto
	9	H. Mumford.....	Trenton
	10	O. R. Jones .....	Marmora
	11	Jno. Perry .....	Maynooth
	12	J. McCaw .....	Bancroft



## List of Division Court Bailiffs, etc,—Continued.

County or District.	No. of Division.	Bailiff.	Post office address.
Huron .....	1	W. T. Moore .....	Goderich.
	2	Fred Welsh .....	Seaforth.
	3	Robt. Welsh .....	Clinton.
	4	Thos Newsome .....	Brussels.
	5	Alex. Davitt .....	Exeter.
	6	James Mallough .....	Dungannon.
	7	Thomas W. Cameron .....	Bayfield.
	8	G. A. Phippen .....	Wingham.
	9	John Brethauer .....	Wroxeter.
	10	C. Eilber .....	Zurich.
	11	J. Beanes .....	Crediton.
	12	Richard Somers .....	Blyth.
Kenora .....	1	R. B. Donkin .....	Kenora.
	2	H. Wright .....	Wabigoon.
	3	D. Wright .....	Dryden.
	4	G. H. Fanning .....	Sioux Lookout
Kent .....	1 {	Charles J. Moore .....	Chatham.
		A. Wells .....	Chatham.
	2	J. N. Wilson .....	Ridgetown.
	3	Alex. Cuthbert .....	Dresden.
	4	H. B. Marshall .....	Blenheim.
	5	Nelson Seed .....	Wallaceburg.
	6	John Eachran .....	Thamesville.
	7	M. Dillon .....	Tilbury
Lambton .....	1	Rich. Macdonald .....	Sarnia.
	2	J. F. Elliott .....	Watford
	3	T. J. Elliott .....	Florence.
	4	N. Cornwall .....	Sombra.
	5	Joseph Burney .....	Forest.
	6	Jno. Patching .....	Thedford.
	7	Ed. Harkness .....	Mooretown.
	8	.....	Petrolia.
	9	Jno. A. Cummings .....	Alvinston.
Lanark .....	1 {	P. J. Lee .....	Perth.
		Robt. Burns .....	Perth.
	2	Jas. Doran .....	Lanark.
	3	H. Wilson .....	Carleton Place.
	4	Richard Craig .....	Smith's Falls.
	5	John Slattery .....	Almonte.
Leeds and Grenville .....	1 {	Ed. Young .....	Brockville.
		R. Stratton .....	Brockville.
	2	I. W. Bradley .....	Prescott.
	3	Thos. Baker .....	Gananoque.
	4	Michael Sweeney .....	Kemptville.
	5	Jno. Wilson .....	Merrickville.
	6	J. W. Russell .....	Delta.
	7	W. G. Richards .....	Frankville.
	8 {	E. J. Leech .....	Newboro.
		J. Steele .....	Westport.
	9	H. C. Phillips .....	Athens.
	10	Jas. P. Lawrence .....	Spencerville.
	11	W. H. Love .....	North Augusta.
	12	W. J. Mallory .....	Mallorytown.

## List of Division Court Bailiffs, etc.—Continued.

County or District.	No. of Division.	Bailiff.	Post office address.
Lennox and Addington .....	1 {	Z. Ham.....	Napanee
		Geo. Greer.....	Napanee
	2	S. M. Rose.....	Bath
	3	R. H. Hawley.....	Dorland
	4	.....	Newburgh
	5	H. W. Wager.....	Enterprise
	6	Geo. Watts.....	Odessa
	7	P. F. Carscallen.....	Tamworth
	8	Jas. Banford.....	Flinton
	9	Chas. P. Stein.....	Denbigh
Lincoln.....	1	Robert Chapman.....	Niagara-on-the-Lake
	2	Richard E. Boyle.....	St. Catharines
	3	A. D. Lacey.....	Smithville
	4	Jos. Grobb.....	Beamsville
	5	H. C. Kelson.....	Grimsby
Manitoulin .....	1	Thos. Griffith.....	Gore Bay
	2	John Ramesbottom.....	Little Current
	3	D. Payette.....	Tehkummah.
Middlesex .....	1	R. Annett.....	London
	2	J. Hall.....	Parkill
	3	N. Ryan.....	Lucan
	4	Henry Eldidge.....	Delaware
	5	James Poole.....	Glencoe
	6	T. F. Hawkin.....	Strathroy
	7	W. H. Shaw.....	Dorchester Station
	8	Thos. A. Shoebottom.....	Arva
	9	A. H. Yerex.....	London
Muskoka .....	1	F. K. Saunders.....	Bracebridge
	2	Chas. Richardson.....	Gravenhurst
	3	H. G. Harper.....	Huntsville
	4	.....	Port Carling
Nipissing.....	1	H. Kinch.....	Sturgeon Falls
	2 {	Aime Jodouin.....	Mattawa
		Jas. Ruddy.....	Whitney
	3	D. McIntyre.....	North Bay
	5	.....	Bonfield
Norfolk .....	1	John Allgeo.....	Simcoe
	2	M. L. Boughner.....	Waterford
	3	J. H. Boyce.....	Windham
	4	W. J. Herron.....	Courtland
	5	Chas. A. Dunkin.....	Vittoria
	6	Plewis Pierce.....	Port Rowan
	7	R. Scruton.....	Hemlock.
	8	G. F. Holden.....	Port Dover
Northumberland and Durham.....	1	M. Munday.....	Bowmanville
	2	Jas. Coleman.....	Newcastle
	3	H. Merrifield.....	Port Hope
	4	George Wallace.....	Millbrook
	5	S. B. Minifie.....	Coldsprings
	6	P. A. Morgan.....	Grafton
	7	Wm. Usher.....	Colborne
	8	Jno. A. Marshall.....	Brighton
	9	William Love.....	Warkworth
	10	F. Ellis.....	Wooler
	11	Jas. Shillinglaw.....	Campbellford

## List of Division Court Bailiffs, etc.—Continued.

County or District.	No. of Division.	Bailiff.	Post office address.
Ontario.....	1	B. F. Campbell ..	Brooklyn
	2	S. H. Stevenson.....	Brougham
	3	Jos. Baird .....	Manchester
	4	J. Steiner.....	Uxbridge
	5	Lachlin McBain.....	Cannington
	6	W. S. Glassford.....	Beaverton
	7	Geo. Elliott.....	Brechin
Oxford .....	1	Benj. Hobson.....	Woodstock
	2	A. W. Burgess .....	Drumbo
	3	J. A. McKay.....	Embro
	4	Arthur Catton .....	Norwich
	5	S. H. Nagle .....	Ingersoll
	6	E. A. Ellis.....	Tillsonburg
	7	Jos. Dewal.....	Tavistock
Parry Sound .....	1	J. A. Johnston .....	Parry Sound
	2	.....	McKellar
	3	Wm. Atkinson .....	Rosseau
	4	H. Stewart .....	Burk's Falls
	5	S. Walton .....	Magnetawan
	6	Jno. Lang .....	Powassan
	7	Jno. Willoughby .....	Sundridge
Peel.....	1	Robt. Taylor.....	Brampton
	2	Wm. Henry Rutledge...	Cooksville
	3	D. McArthur.....	Caledon
	4	Thos. Barons .....	Bolton
Perth.....	1	D. W. Forbes .....	Stratford
	2	John Coppin .....	Mitchell
	3	Wm. Box.....	St. Mary's
	4	Jno. S. Gabel.....	Shakespeare
	5	F. W. Guenther .....	Milverton
	6	R. Woods .....	Listowel
Peterborough.....	1	Thomas Laplante .....	Peterborough
	2	F. J. Stewart .....	Norwood
	3	Robt. Webster .....	Lakefield
	4	.....	Lasswade
	5	A. Waller .....	Havelock
	6	Thos. McIntyre .....	Keene
Prescott and Russell.....	1	S. W. Wright .....	L'Orignal
	2	I. Labrosse .....	Vankleek
	3	Michael Kelly .....	St. Eugene
	4	John A. Peltier .....	Plantagenet
	5	.....	Navan
	6	Thos. Yonge.....	Russell
	7	D. Millette .....	Hawkesbury.
	8	Ira Gates.....	Routhier
	9	H. Larocque.....	Alfred
	10 {	John A. Dent.....	Rockland
		Moise Laviolette .....	Clarence Creek
	11	A. L. Macdonald .....	South Indian

## List of Division Court Bailiffs, etc.—Continued.

County or District.	No. of Division.	Bailiff.	Post office address.
Prince Edward.....	1	S. A. Ruttan.....	Picton
	2	G. N. Ostrander.....	Milford
	3	George Farrell.....	Demorestville
	4	A. Harvey.....	Ameliasburg
	5	R. L. Smith.....	Wellington
	6	J. W. Branscombe.....	Bloomfield
	7	Herman W. Weeks.....	Consecon
	8	E. A. Williams.....	Waupoos
Rainy River.....	1	J. B. Masher.....	Fort Frances
	2	.....	Emo
	3	.....	Rainy River
Renfrew.....	1	Geo. McDonald.....	Pembroke
	2	John Beaupre.....	Beachburg
	3	C. Miller.....	Renfrew
	4	John Warnock, jr.....	Arnprior
	5	Wm. Luloff.....	Eganville
	6	Jno. Jardine.....	Cobden
	7	Jno. Roche.....	Killaloe Sta.
Simcoe.....	1	John Weymouth.....	Barrie
	2	W. Simpkin.....	Bradford
	3	D. W. Watson.....	Beaton
	4	A. W. S. Cunningham.....	Collingwood
	5	Ed. Corlett.....	Hillsdale
	6	George Reeve.....	Orillia
	7	Wm. Switzer.....	New Lowell
	8	John R. Arnold.....	Alliston
	9	Ed. E. J. Hewson.....	Penetanguishene
	10	G. A. Abbott.....	Coldwater
Stormont, Dundas and Glengarry ...	1	John Burgess.....	Williamstown
	2	J. J. Kennedy.....	Alexandria
	3	W. S. Smith.....	Cornwall
	4	J. P. Ferguson.....	Osnabrock Centre
	5	Jacob Hopper.....	Morrisburg
	6	C. Larabee.....	Iroquois
	7	E. Bush.....	South Mountain
	8	A. McIntosh.....	Finch
	9	D. J. McDonell.....	North Lancaster
	10	E. Merkley.....	Chesterville
	11	Chas. W. Kahala.....	Avonmore
	12	Donald J. Robertson.....	Maxville
Sudbury.....	1	C. Gravelle.....	Sudbury
	2	H. Gratton.....	Chelmsford
	3	W. Lyness.....	Chapleau
	4	J. H. Boyd.....	Webbwood
Temiskaming.....	1	J. D. McKay.....	Haileybury
	2	W. G. Armstrong.....	New Liskeard
	3	William McPherson.....	Englehart
	4	C. M. McCarthy.....	Elk Lake
	5	H. Warren.....	South Porcupine
	6	E. A. Cottrell.....	Cochrane



## List of Division Court Bailiffs, etc.—Concluded.

County and District.	No. of Division.	Bailiff.	Post office address.
Thunder Bay.....	1 { 3	A. Clavet ..... R. L. Goldie ..... James Cross.....	Port Arthur Schrieber Nipigon Fort William
Victoria .....	1 2 3 4 5 6 7	S. Dumond..... E. Mark..... W. Mitchell..... W. R. McQuade ..... J. W. Wallace..... Wm. J. McCullough .....	Woodville Fenelon Falls Bobcaygeon Omeme Lindsay Oakwood Kirkfield
Waterloo .....	1 2 3 4 5 6 7	S. E. Moyer..... W. A. Bolduc . Levi Bawtinheimer ... E. Scherer..... Benj. J. Ballard ..... Benj. J. Ballard ..... Jas. G. Watson .....	Berlin Preston Galt New Hamburg Hawkesville Hawkesville Ayr
Welland.....	1 2 3 4 5 6	J. C. Nixon ... Jno. Haymes..... Jno. R. Huffman..... W. P. Gouder .....	Welland Marshville Ridgeway Niagara Falls South Thorold Port Colborne
Wellington....	1 { 2 3 4 5 6 7 8 10 11	Jno. Ogg..... Wm. Young..... Jno. Ogg..... ..... Wm. M. Frank..... Peter McGill ..... J. W. Love..... Wm. Richards..... O. D. White..... Henry Torrance..... Thos. Ryan ..	Guelph Guelph Guelph Rockwood Fergus Erin Elora Drayton Arthur Clifford Mount Forest
Wentworth .....	1 2 3 4 5 7 8 9	Jas. Bryers..... Alex. Misener... C. Teeple .....	Hamilton Dundas Waterdown Troy Stoney Creek Binbrook Binbrook Hamilton
York.....	1 2 3 4 5 6 7 8 9 10	Chas. Synge.. Vernon Lowrey ..... Geo. Thompson..... A. E. Widdifield..... Peter Grant..... ..... Thos. Rowntree ..... A. Kaake..... Jos. Skelton..... Frank Woods .....	Toronto Locust Hill Richmond Hill Newmarket Sutton Aurora Woodbridge Weston Scarboro Toronto

## TABLE D.

DIVISION COURTS, LIMITS OF THE RESPECTIVE DIVISIONS  
IN THE PROVINCE OF ONTARIO, AND  
JUDICIAL OFFICERS.

## ALGOMA.

F. Stone, Judge, Sault Ste. Marie.

M. McFadden, J. J., Sault Ste. Marie.

F. J. S. Martin, Crown Attorney and Clerk P., Sault Ste. Marie.

1.—Bounded west by Thunder Bay District, 85th parallel of west longitude and east by Bar River, including all the islands in front.

2.—Bounded west by Bar River and east by the westerly boundary of the Townships of Thessalon, Kirkwood, Bridgeland, Houghton and Otter, and by said boundary line of the last five named townships produced northerly.

3.—Bounded west by the westerly boundary of the Townships of Thessalon, Kirkwood, Bridgeland, Houghton and Otter, and the boundary line of the last named five townships produced northerly to the northern boundary of the District, and on the east by a line produced northerly between the Townships of Bright and Thompson to the northern boundary of the District of Algoma.

6.—Consisting of St. Joseph's Island.

7.—All the Territory of the District of Algoma lying east of the eastern boundary of the Third Division including the Village of Cutler and Johns Island.

## BRANT.

A. D. Hardy, Judge, Brantford.

A. J. Wilkes, C.C.A. and C.P., Brantford.

1.—The City of Brantford and that part of the Township of Brantford not included in the other divisions hereinafter described. The Townships of Onondaga and Tuscarora and that part of the Township of Brantford lying south of the main road from Brantford to Hamilton and east of Fairchild's Creek.

2.—The Town of Paris and that part of South Dumfries west of the line between lots 18 and 19, and that part of the first concession of the Township of Brantford lying west of a continuation of the last-mentioned line.

3.—The remainder of the Township of South Dumfries and of the first concession of the Township of Brantford.

4.—The ten northern concessions of the Township of Burford, and all that part of the 2nd, 3rd, 4th and 5th concessions of the Township of Brantford, west of the line between lots numbers 10 and 11, and that portion of the Kerr tract west of the continuation of the last-mentioned line.

5.—The Township of Oakland, the four southern concessions of the Township of Burford and lots numbers 1 to 5, inclusive, in the ranges east and west of the Mount Pleasant Road, in the Townships of Brantford, adjoining the Township of Oakland.

## BRUCE.

Wm. Barrett, Judge, Walkerton.

A. B. Klien, J.J., Walkerton.

Thomas Dixon, C.C.A. and C.P., Walkerton.

1.—The Town of Walkerton and the Township of Carrick and the Township of Brant, south of the 12th concession, in the lots up to No. 26, and south of the 10th concession, in lots 26 to 34, inclusive.

2.—The Village of Teeswater, the Townships of Culross and Greenock south of the 12th concession.

3.—The Town of Kincardine, the Township of Kincardine, lying south of the 10th concession.

4.—The Village of Paisley, and that part of the Township of Brant lying north of 11th concession and west of lot 26. That part of Greenock lying north of concession 11; lots 26 to 35, inclusive, in the 8th, 9th, 10th, 11th, 12th, 13th and 14th concessions of the Township of Bruce; and Saugeen, east of a line between lots 28 and 29, and south of the proportion of the town line between Arran and Elderslie to the Saugeen River. All Elderslie lying west of the 25th side line and south of the 12th concession. And also that part lying north of concession 11 and west of lot 17.

5.—All of the Township of Amabel lying north of the 10th concession, Port Elgin and Southampton, and all Saugeen not in No. 4, Arran, west of the line between lots 10 and 11, north of Arran Lake and its outlet, and Amabel, south of concession 11, and west of concession C, and concessions 8, 9 and 10.

6.—The Village of Tiverton and all the Township of Bruce, except that part included in No. 4, and all Kincardine north of the 9th concession.

7.—Tara and all Arran, not in No. 5, and all Elderslie, not in Nos. 4 and 12, and Amabel, south of the 8th concession and east of concession lettered C.

8.—The Town of Wiarton, the Township of Albemarle and that part of Amabel not in Nos. 5 and 7.

9.—The Township of Huron.

10.—The Townships of Eastnor, Lindsay, and St. Edmunds.

11.—Lucknow and the Township of Kinloss.

12.—Chesley and those parts of Brant and Elderslie not included in Nos. 1, 4 and 7.

#### CARLETON.

D. B. McTavish, Judge, Ottawa.

R. D. Gunn, J.J., Ottawa.

J. A. Ritchie, C.C.A. and C.P., Ottawa.

1.—Comprising all the City of Ottawa and the Township of Gloucester, to lot 15, inclusive, Rideau Front, and concessions 1 and 6, inclusive, Ottawa Front and the islands in the Ottawa River opposite thereto.

2.—The Township of Goulbourne, the 8th, 9th and 10th concessions of the Township of Marlborough, all the Township of Nepean south of the River Goodwood, and the 4th, 5th and 6th concessions thereof north of the same river to the boundary line between lots 20 and 21 in the last-mentioned concession.

3.—The Township of Huntley and the Township of March, except lots 1 to 5, inclusive, in concessions 1, 2, 3 and 4 thereof.

4.—The Townships of Fitzroy and Torbolton.

5.—The Township of North Gower, Long Island in the Rideau River, and 1st, 2nd, 3rd, 4th, 5th, 6th and 7th concessions of Marlborough.

6.—The Township of Osgoode, the 6th, 7th and 8th concessions Ottawa Front, and from lots 16 to 30, inclusive, of Rideau Front of the Township of Gloucester.

7.—The Township of Nepean, except the City of Ottawa, and part of the said Township lying south of the River Goodwood and concessions 4, 5 and 6, north of

the River Goodwood to the boundary between lots 20 and 21 in the said last-mentioned concessions, and, including also lots 1 to 5, inclusive, in concession 1, 2, 3 and 4, in the Township of March.

#### DUFFERIN.

W. G. Fisher, Judge, Orangeville.

W. J. L. McKay, C.C.A. and C.P., Orangeville.

1.—The Town of Orangeville, the Township of East Garafraxa and all that portion of the Township of Amaranth lying south of the southern boundary of lot No. 26, in each concession in the Township of Amaranth.

2.—The Village of Shelburne, the Township of Melancthon, and all that portion of the Township of Amaranth lying north of the southern boundary of lot number 26, in each concession of the Township of Amaranth.

3.—The Township of Mulmur.

4.—The Township of Mono.

5.—The Township of East Luther.

#### ELGIN.

C. W. Colter, Judge, St. Thomas.

C. O. Z. Ermatinger, J.J., St. Thomas.

A. McCrimmon, C.C.A. and C.P., St. Thomas.

1.—The Townships of Bayham, Malahide and South Dorchester.

2.—The Townships of Southwold and Yarmouth (except the City of St. Thomas).

3.—The City of St. Thomas.

4.—The Townships of Aldborough and Dunwich.

#### ESSEX.

J. O. Dromgole, Judge, Sandwich.

G. Smith, J.J., Sandwich.

J. H. Rodd, C.C.A. and C.P., Windsor.

1.—Town of Sandwich and Township of West Sandwich.

2.—Town of Amherstburg and the Townships of Alden and Anderdon.

3.—The Village of Kingsville, and all that part of the Township of Gosfield not included in Division No. 8.

4.—The Township of Colchester South, and all Colchester North south of the 9th concession, exclusive of the said concession, and the lots on both sides of Maiden Street.

5.—Township of Mersea and Village of Leamington.

6.—The Township of Rochester, the Village of Belle River, the first concession of the Township of Maidstone, and all north of the Middle Road in the said Township of Maidstone.

7.—Town of Windsor, the Town of Walkerville, and all of Sandwich East north of the Talbot Street range.

8.—The Town of Essex, and all of the Township of Maidstone lying west of the first concession and south of the Middle Road; so much of Sandwich East as is south of Talbot Street, including the lots on both sides of said street to Nos. 306



and 307; all of Colchester north of the 9th concession, including said concession and lots on both sides of Maiden Street, and all that part of Gosfield lying north of concession 6, and extending as far east from the limits between Gosfield and Colchester as lots No. 12, including such lot in each concession north of concession 6, inclusive.

9.—The Townships of Tilbury West and Tilbury North.

10.—The Township of Pelee.

#### FRONTENAC.

H. R. Lavell, Judge, Kingston.

J. L. Whiting, C.C.A. and C.P., Kingston.

1.—City of Kingston, Township of Garden Island, Wolfe Island, Howe Island, and part of the Township of Pittsburg.

2.—Cataraqui, the Township of Kingston and the Village of Portsmouth.

3.—Loughboro', the Townships of Loughboro' and Bedford.

4.—Verona, Townships of Portland and Hinchinbrooke.

5.—Sudbury, the Township of Storrington and part of the Township of Pittsburg.

6.—The Townships of Olden, Oso, Barrie, Clarendon, Palmerston, Miller, Canonto, and South Canonto.

7.—The Township of Kennebec.

#### GREY.

C. O. Sutherland, Judge, Owen Sound.

C. H. Widdifield, J. J., Owen Sound.

J. Armstrong, C.C.A. and C.P., Owen Sound.

1.—The Town of Owen Sound, the Village of Brooke and the Townships of Derby, Keppel, Sarawak and Sydenham.

2.—The Town of Durham, the Township of Egremont, and those portions of the Townships of Bentinck, Normanby and Glenelg as follows:—That part of the Township of Bentinck lying east of the line between lots 30 and 31 in the 1st, 2nd and 3rd concessions south of the Durham Road, and in concessions 1, 2 and 3 north of the Durham Road, and east of the line between lots 15 and 16 in concessions 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 and 15 thereof. That part of the Township of Normanby lying east of the line between lots 20 and 21, in the 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th, 15th, 16th, 17th and 18th concessions, and all of the Township of Glenelg, excepting that portion lying east of the line between lots 10 and 11 in the 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th and 15th concessions thereof.

3.—The Town of Meaford, the Township of St. Vincent, and that part of the Township of Euphrasia, lying west of the line between the 6th and 7th concessions and north of the line between lots 15 and 16.

4.—The Township of Collingwood and the east half of the Township of Euphrasia, excepting that part thereof lying between the 4th and 5th concessions and south of the lots between 12 and 13, and east half of the Township of Osprey.

5.—The Township of Proton, the west half of the Township of Osprey, and those parts of the Township of Artemesia consisting of the ranges of lots lying parallel to the Toronto and Sydenham Road, and south of the line between lots 130 and 131, and concessions 1, 2 and 3, south of the Durham Road, and 1, 2, 3, 4, 5 and 6 north of the said Durham Road, and those portions of concessions 7,

8 and 9 lying east of the ranges of lots parallel with the Toronto and Sydenham Road, and those portions of concessions 10, 11, 12, 13 and 14 lying east of the line between lots 30 and 31.

6.—The Township of Sullivan and the Township of Holland, excepting those portions of concessions 9, 10, 11 and 12 lying south of the line between lots 15 and 16, and those portions of concessions 7 and 8 west of the ranges of lots lying parallel with the Toronto and Sydenham Road, and the ranges of lots lying parallel with the Toronto and Sydenham Road and south of the line between lots 50 and 51.

7.—All the lots from 1 to 30, inclusive, in the three concessions south and the three concessions north of the Durham Road in the said Township of Bentinck, and all the lots from 1 to 15, inclusive, in the 12th concession, from the 4th to the 15th concessions, inclusive, of the said Township of Bentinck, and all the lots from 1 to 20, inclusive, in all the concessions from 4 to 18, inclusive, in the Township of Normanby aforesaid.

8.—All the lots from 51 to 130, inclusive, in all the concessions parallel to and being northeast and southwest of the Toronto and Sydenham Road, in the Townships of Artemesia, Glenelg and Holland aforesaid; all lots to the westward of the dividing line between lots 30 and 31, in all the concessions from 10 to 14, inclusive, and all the lots from 1 to 5 in the 7th, 8th and 9th concessions, inclusive, which lie to the southwest of the third concession, southwest of the said Toronto and Sydenham Road, in the said Township of Artemesia; all the lots from 1 to 15, inclusive, in concessions 5 and 6, and all the lots from 1 to 15, inclusive, in the concessions from 7 to 12, inclusive, in the Township of Euphrasia; all lots south of the allowance for road between lots 15 and 16, in the 9th, 10th, 11th, and 12th concessions, and from lots 25 to 30, inclusive, on the 7th concession, and lots 28, 29 and 30 in the 8th concession of the said Township of Holland; and all the lots lying east of allowance for road between lots 10 and 11 in all the concessions from 7 to 15, inclusive, in the Township of Glenelg.

#### HALDIMAND.

G. B. Douglas, Judge, Cayuga.

J. A. Murphy, C.O.A. and C.P., Cayuga.

1.—Comprising the Township of Seneca except the first and second concessions, the Young Tract, and the property of the late Richard Martin and the late Robert Weir: all of the Township of Oneida, except the first range north of the Cayuga line, the Dennis Tract, and the lots southerly of the said tract, and the Village of Caledonia.

2.—Comprising the Township of North Cayuga, except that portion thereof lying northeast of the side line between lots 12 and 13, and 1st and 2nd concessions of the Township of Seneca, except that portion thereof lying northeast of the side line between lots 12 and 13, the Young Tract, and the lands of the late Robert Weir and Richard Martin, Esquires, in the said Township of Seneca, the first range of Oneida north of the Cayuga line, also the Dennis Tract and river lots lying south, and the Townships of Rainham and South Cayuga.

3.—Comprising the Townships of Moulton, Sherbrooke and Dunn, and the Town of Dunnville.

4.—Comprising the Township of Walpole, and the Village of Hagersville.

5.—Comprising the Township of Canboro', that portion of North Cayuga lying east of the side line between lots 12 and 13, and those parts of the 1st and 2nd concessions of the Township of Seneca lying northeast of the side line between lots 12 and 13.

## COUNTY OF HALIBURTON.

(Annexed to Victoria for Judicial Purposes.)

J. E. Harding, Judge, Lindsay.

H. McMillan, J.J.

A. P. Devlin, C.P. and C.C.A., Lindsay.

1.—The Townships of Glamorgan and Snowden, except that portion of both included in the third division, and all of the Townships of Snowden, Lutterworth, Minden, Anson, Stanhope, Hindon.

2.—The Townships of Dysart, Guilford, Harburn, Dudley, Harcourt and Bruton, and that portion of Monmouth not included in the third division.

3.—All the rest of the territory comprising Township of Monmouth (except lots 1 and 19, inclusive) in 13th, 14th, 15th, 16th and 17th concessions; the south 12 concessions of the Township of Glamorgan, and from lot 21, inclusive, to the eastern boundary in the south six concessions of Snowden.

4.—The Townships of Shelbourne, McClintock, Livingstone, Lawrence, Nightingale, Havelock, Eyre and Clyde.

## HALTON.

J. W. Elliott, Judge, Milton.

W. I. Dick, C.C.A. and C.P., Milton.

1.—All the territory comprised in the new survey of the Township of Trafalgar, and the first ten lots in concessions 1, 2, 3, 4, 5 and 6 in the Township of Esquesing, and the first five lots in concessions 7, 8, 9, 10 and 11 in the said township.

2.—That part of the Township of Trafalgar known as the Old Survey.

3.—All the rest of the territory comprised in concessions 8, 9, 10 and 11 in the Township of Esquesing not comprised in the first division.

4.—All the rest of the territory comprised in concessions 1, 2, 3, 4, 5 and 6, Township of Esquesing.

5.—The Township of Nassegaweya.

6.—The Township of Nelson.

## HASTINGS.

G. E. Deroche, Judge, Belleville.

E. B. Fralick, J.J., Belleville.

P. J. M. Anderson, C.C.A. and C.P., Belleville.

1.—To comprise the City of Belleville and the Township of Thurlow; also all that portion of the Township of Sidney lying south of the 8th concession and east of the line between lots 18 and 19.

2.—Comprising the Townships of Wollaston, Limerick and Cashel, and the six northerly concessions of the Townships of Tudor and Grimsthorpe, and all those parts of the Township of Lake, in all the concessions thereof lying north of lots 21 in said concessions, all in the County of Hastings.

3.—The Township of Tyendinaga, except that part called Deseronto.

4.—The Township of Hungerford.

5.—All that part of the Township of Sidney which lies to the north of the 8th concession, and to the east of lot No. 6, in each concession north of the 8th concession, and all that part of the Township of Rawdon which lies to the south of the 9th concession, and that part of the Township of Huntingdon south of the 5th con-



cession; also Block A and lots 1, 2, 3, 4, 5 and 6, in the 8th and 9th concessions of the Township of Sydney heretofore forming part of the 2nd division, together with all that portion of the Township of Sidney lying north of the 7th concession, and east of the line between lots 6 and 7.

6.—The Township and Village of Madoc, all that part of the Township of Huntingdon north of the 6th concession of said township, and all of the Townships of Tudor and Grimsthorpe, except the northerly six concessions of each of the said townships.

7.—The Village of Deseronto.

9.—The Town of Trenton, and all that part of the Township of Sidney which lies to the west of lot 7 in each of the concessions of the township, including Mill Island. Also, all of said Township of Sidney lying south of the 8th concession and west of the line between 18 and 19, and east of the line between lots 6 and 7.

10.—The Township of Marmora, that part of the Township of Lake lying south of lots 22 in all the concessions thereof, and all that part of the Township of Rawdon which lies north of the 8th concession thereof.

11.—The Townships of Herschell, Monteagle, Carlow, Bangor, Wicklow and McClure.

12.—The Townships of Faraday, Dungannon and Mayo, and the Village of Bancroft.

#### HURON.

B. L. Boyle, Judge, Goderich.

Philip Holt, J.J., Goderich.

Chas. Seager, C.C.A. and C.P., Goderich.

1.—Comprising the Town of Goderich, that part of the Township of Goderich to the north of the Cut Line and the Huron Road until the same meets the road allowance between the 13th and 14th concessions, then back along the Huron Road to its junction with the Cut Line, then west by the road allowance between concessions 11 and 12 to the River Maitland, then along the River Maitland to Goderich, together with the Township of Colborne.

2.—Comprising the Township of McKillop, the Town of Seaforth, and all that portion of the Township of Tuckersmith not included in the third division.

3.—Comprising all that portion of the Township of Hullett south of the blind line between the 7th and 8th concessions, of the Township of Hullett, that part of the Township of Goderich not included in Nos. 1 and 7, 1st, 2nd, 3rd and 4th concessions, Township of Stanley 1st and 2nd concessions, Township of Tuckersmith, L.R.S., north of lot 15, and that portion west of side road between lots 25 and 26, H.R.S., and Town of Clinton.

4.—Comprising the Township of Grey, all of the Township of Morris east of side road between lots Nos. 10 and 11 (which is not included in No. 12), and the Village of Brussels.

5.—Comprising the Townships of Usborne and the Village of Exeter.

6.—Comprising the Townships of Ashfield and all West Wawanosh, except that portion east of Maitland River.

7.—Comprising the Township of Goderich, south of Cut Line and Huron Road until the same joins the road between the 12th and 14th concessions of the Township of Goderich; thence along the said concessions until the same joins the River Bayfield, all Stanley not included in No. 3 and the Village of Bayfield.

8.—Comprising the Village of Wingham, the Township of Turnbury, all that part of East Wawanosh not included in No. 12, and all of the Township of Morris not included in Nos. 4 and 12.



9.—Comprising the Township of Howick and the Village of Wroxeter.

10.—Comprising the Township of Hay.

11.—Comprising the Township of Stephen.

12.—Commencing at the northeast angle of the Township of Hullett, thence southerly along the easterly boundary of the said Township of Hullett to the blind line between the 7th and 8th concessions of said township, thence westerly along said line to the western boundary of the township, thence northerly along the westerly boundary of the township to the Maitland River at the southeastern corner of the Maitland Block, thence along the said river northerly till the western boundary of East Wawanosh is reached, thence northerly along said westerly boundary to the road running between the 6th and 7th concessions of said Township of East Wawanosh, thence easterly along said road to the easterly limit of said township, thence northerly along the gravel road to the road running between the 5th and 6th concessions of the Township of Morris, thence easterly along said road to the line between lots 10 and 11, thence southerly along said line between the 6th and 7th concessions, thence easterly along said line to the line between lots 15 and 19, thence southerly to the boundary line between the Townships of Morris and Hullett, thence easterly to the place of beginning, including the Village of Blyth.

#### DISTRICT OF KENORA.

T. W. Chapple, Judge, Kenora.

J. F. MacGillivray, C. Atty. and C.P., Kenora.

1.—Comprising all the portion of the said District of Kenora lying west of the Seventh Meridian Line, including the Towns of Kenora and Keewatin.

2.—Comprising all that portion of the said District lying east of the eastern boundary of the Third Division, south of the northern boundaries of the Townships of Zealand and Hartman to the eastern boundary of the said District, including the Municipality of Ignace.

3.—Comprising all that portion of the said District lying between the Seventh Meridian Line and a line drawn parallel with the western boundary of lot 10 in the Township of Zealand, and extending northward to the northern boundary of the said District and southward to the southern boundary thereof, including the Town of Dryden.

4.—Comprising all that portion of the said Second Division, lying north of a line drawn eastward along the northern boundaries of the Townships of Zealand and Hartman, to the eastern boundary of the said District of Kenora.

#### KENT.

Archibald Bell, Judge, Chatham.

John L. Dowlin, J.J., Chatham.

H. D. Smith, C.C.A. and C.P., Chatham.

1.—The First Division to consist of the Town of Chatham and that part of the Townships of Dover East and West to the south of the 12th and 13th concession line of the Township of Dover East, and that part of the Township of Chatham south of the 12th and 13th concession line, and west of the side roads between lots 12 and 13, from the first mentioned 12th and 13th concession line to the 5th and 6th concession line, and all south of the said 5th and 6th concession line of said township; that part of the Township of Harwich north of 5th and 6th concession line, by the easterly boundary; that part of the Township of Raleigh north of the 16th concession to the west side road between lots 12 and 13 north to the 6th and 7th concession line, and all of the said township north of the said last-mentioned line, and that part of the Township of Tilbury East north of the 4th concession.

2.—The Second Division to consist of that portion of Township of Howard south of the 2nd and 3rd concession line by the eastern boundary (known as the Botany Road), and that part of the Township of Orford south of the 10th and 11th concession line of said township.

3.—The Third Division to consist of all that part of the Gore of Camden lying west of the 10th and 11th concession line, and that part of the Township of Camden lying west of the side line between lots 6 and 1; the Village of Dresden, and that part of the Township of Chatham north of the 5th and 6th concession line and east of the side roads between lots 12 and 13.

4.—The Fourth Division to consist of that part of the Township of Harwich south of the 5th concession of the eastern boundary, and south of the 3rd concession by the western boundary, and that part of Raleigh south of the 15th concession and east of the side road between lots 12 and 13 and the road to the shore through lot 146 on the Talbot Road.

5.—The Fifth Division to consist of the Village of Wallaceburg, the Gore of Chatham and that part of the Township of Chatham northwest of the 12th and 13th concession line, and west of the said roads between lots 12 and 13, and that part of Dover lying north of the 12th and 13th concession side road.

6.—The Sixth Division to consist of that part of the Township of Howard north of the Botany Road aforesaid, and that part of the Township of Oxford north of the 10th and 11th concession line, the Township of Rone, the Township of Bothwell, the Village of Thamesville, and that part of the Gore of Camden east of the 10th and 11th concession line, and that part of the Township of Camden east of the side line between lots 6 and 7.

7.—The Seventh Division to consist of that part of Tilbury East south of the 3rd concession, the Township of Romney, and that part of the Township of Raleigh south of the 6th and 7th concession line, and west of the side road between lots 12 and 13, in the said township, and the road through lot 147 on Talbot Road.

#### LAMBTON.

D. F. McWatt, Judge, Sarnia.

A. E. Taylor, J.J., Sarnia.

J. P. Bucke, C.C.A. and C.P., Sarnia.

1.—The external boundaries of the Township of Sarnia and the Town of Sarnia.

2.—The external boundaries of the Township of Warwick, including that portion of the Village of Arkona south of the township line.

3.—The external boundaries of the Townships of Euphemia and Dawn.

4.—The external boundaries of the Township of Sombra.

5.—The external boundaries of the Township of Plympton.

6.—The external boundaries of the Township of Bosanquet, including that portion of the Village of Arkona north of the township line.

7.—The external boundaries of the Township of Moore.

8.—The external boundaries of the Township of Enniskillen.

9.—The external boundaries of the Township of Brock.

#### LANARK.

J. H. Scott, Judge, Perth.

E. G. Malloch, C.C.A. and C.P., Perth.

1.—The Town of Perth, and the Townships of Drummond, Bathurst, South Sherbrooke, Burgess North, and that part of the Township of Elmsley North, north of the Rideau River, within the County of Lanark, and west of lot No. 12 in each concession. The sittings of said court to be held in the Town of Perth.

2.—The Second Division to consist of the Village of Lanark, and the Townships of Lanark, Dalhousie, Darling, Lavant and North Sherbrooke. The sittings of said court to be held at the Village of Lanark.

3.—The Third Division to consist of the Town of Carleton Place and the Township of Beckwith, and the first six lots in the first seven concessions of Township of Ramsay. The sittings of said court to be held in the Town of Carleton Place.

4.—The Township of Montague, the Town of Smith's Falls, and that part of the Township of North Elmsley, from lot No. 1 to lot No. 12, in each concession, both inclusive, not within the limits of the Town of Smith's Falls. Sittings at Smith's Falls.

5.—The Township of Pakenham, the Town of Almonte, and the Township of Ramsay, with the exception of the first six lots in the first seven concessions of the said township. Sittings at Almonte.

### LEEDS AND GRENVILLE.

H. S. McDonald, Judge, Brockville.

E. J. Reynolds, J.J., Brockville.

M. M. Brown, C.C.A. and C.P., Brockville.

1.—To consist of the 1st, 2nd, 3rd, 4th, 5th, 6th and 7th concessions and broken front of the Township of Elizabethtown, and the concession roads between them.

2.—To consist of the 1st, 2nd, 3rd, 4th and 5th concession, and broken front and that part of the 6th, 7th and 8th concessions from the town line of Edwardsburg to lot No. 18, inclusive, of the Township of Augusta, and the concession roads between them.

3.—To consist of the 1st, 2nd, 3rd, 4th and 5th concessions and broken front of the Townships of Leeds and Lansdowne, respectively, and the concession roads between them.

4.—To consist of the Township of South Gower, the Township of Oxford from the west side line of lots No. 11 in all the concessions of the eastern boundary of the township, and the gore of land between South Gower, Oxford and Edwardsburg.

5.—To consist of the Township of Wolford (except the 7th and 8th concessions and the allowances of roads within and between them); lots Nos. 1 to 10, inclusive, in the 2nd, 3rd, 4th, 5th, 6th, 7th and 8th concessions of the Township of Oxford, and allowances of roads within and between them.

6.—To consist of the Townships of Bastard and Burgess, and those parts of the Townships of Leeds and Lansdowne, on the north side of the rear of the 5th concession in each respectively.

7.—To consist of the Townships of Kitley and Elmsley.

8.—To consist of the Townships of North Crosby and South Crosby.

9.—To consist of that part of the Townships of Escott and Yonge, in rear of the 4th concession of Yonge, and in rear of the 6th concession of Escott; that part of the Township of Elizabethtown, in rear of the 7th concession of and west of lot No. 18 in the 8th, 9th, 10th and 11th concessions, and the allowances for roads embraced therein.

10.—To consist of the Township of Edwardsburg.

11.—To consist of that part of the Township of Augusta in rear of the 5th concession and west of lot No. 18 in the 6th, 7th and 8th concessions; the whole of the 9th and 10th concessions of the Township of Augusta; the Gore between the



Townships of Oxford, Wolford and Augusta; that part of the Township of Elizabethtown in rear of the 7th concession, and east of the commons, between lots No. 18 and 19 in the 8th, 9th and 10th concession; the 7th and 8th concessions of the Township of Wolford; lots No. 1 to 10, inclusive, in the 9th and 10th concessions of the Township of Oxford; and the allowance for roads embraced therein.

12.—To consist of the 1st, 2nd, 3rd and 4th concessions and broken front of the Township of Yonge; the 1st, 2nd, 3rd, 4th, 5th and 6th concessions and broken front of the Township of Escott, and the allowances for roads embraced therein.

The said 1st, 2nd and 12th divisions shall respectively embrace and comprehend within their lines those portions of the River St. Lawrence and islands therein, within the exterior lines of which such portions of said river and islands would lie and be, if such exterior side lines were produced and extended in that direction to the utmost limits of the Province.

### LENNOX AND ADDINGTON.

Jas. H. Madden, Judge, Napanee.

H. M. Deroche, C.C.A. and C.P., Napanee.

1.—The Town of Napanee, Township of Richmond, all that part of North Fredericksburg and Adolphustown lying north of Hay Bay, and all that part of North Fredericksburg lying north of Big Creek.

2.—Comprises 1st concession of Ernestown, the Village of Bath, the Township of Andover Island, and the 2nd, 3rd and 4th concessions of the said Township of Ernestown, from the west limits thereof to the west limit of lot No. 21 in each concession.

3.—Township of South Fredericksburg and all that part of North Fredericksburg and Adolphustown not included in Division No. 1.

4.—1st, 2nd and 3rd concessions of the Township of Camden and the Village of Newburg.

5.—All that part of the Township of Camden not included in Division No. 4.

6.—All that portion of the Township of Ernestown not included in the limits of Division No. 2.

7.—Township of Sheffield.

8.—Townships of Kaladar, Anglesea and Effingham.

9.—Townships of Abinger, Ashby and Denbigh.

### LINCOLN.

R. B. Carman, Judge, St. Catharines.

M. Brennan, C.C.A. and C.P., St. Catharines.

1.—The Town and Township of Niagara.

2.—The Township of Grantham (including the City of St. Catharines), the Villages of Merriton and Port Dalhousie and the Township of Louth.

3.—The Townships of Caistor and Gainsborough and the 9th concession of the Township of Grimsby, including the 1st and 2nd ranges as part of the said concession.

4.—The Village of Beamsville and the Township of Clinton.

5.—The Village of Grimsby, the Township of North Grimsby, and the Township of South Grimsby, except that portion included in the Third Division.



## DISTRICT OF MANITOULIN.

C. E. Hewson, Judge, Gore Bay.

W. F. McRae, C.A., and C.P., Gore Bay.

1.—The Town of Gore Bay, the Townships of Gordon, Allan, Campbell, Mills, Burpee, Robinson, Dawson, The Islands, Barrie, Clapperton and the Duck Islands, and that part of the Township of Billings lying west of the road allowance between lots 15 and 16 in the several concessions thereof, and so much of the Township of Carnarvon as lies west of Lake Mindemoya and north of the line between the 6th and 7th concessions thereof, and Cockburn Island.

2.—The Town of Little Current, the Township of Howland and those parts of the Townships of Sheguindah and Bidwell lying north of the line between the 6th and 7th concessions of Sheguindah and the 4th and 7th concessions of the Township of Bidwell, and the 6th and 7th concessions of the line between lots 17 and 18 in the Township of Billings, and the adjacent islands lying north and east of the said Townships, except the Clapperton Island.

3.—Manitowaning, the Townships of Assiginack, Tebkummah and Sandfield, and those parts of the Township of Sheguindah lying south of the line between the 4th and 5th concessions of the Township of Bidwell and the 6th and 7th concessions of the Township of Billings to the line between lots 17 and 18 of said township, and the Township of Carnarvon, except so much of the same as lies west of Mindemoya Lake, and all the part of Manitoulin lying east of the Township of Assiginack, Manitowaning and South Bays and the islands adjacent thereto.

## MIDDLESEX.

Talbot Macbeth, Judge, London.

Edward Elliott, J.J., London.

J. B. McKillop, C.C.A., and C.P., London.

1.—That part of the City of London lying to the west of Maitland street with that portion of the Township of London lying south of the line between the 4th and 5th concessions and west of the said street, produced northerly on a line in the same direction to the line between the said 4th and 5th concessions, and with that portion of the Township of Westminster lying west of the main road leading south from Clark's Bridge, across the Thames, south to the line between the 1st and 2nd concessions, and westerly to the line between lots 42 and 43, and extending northerly to the River Thames, and also including the Village of London West.

2.—The Villages of Parkhill and Ailsa Craig, the Townships of East Williams and West Williams, and that portion of the Township of Lobo lying north of the line between the 11th and 12th concessions, and east of the lines between lots Nos 12 and 13.

3.—The Townships of McGillivray and Biddulph and the Village of Lucan.

4.—The Township of Delaware, with that portion of the Township of Westminster west of the line between lots 30 and 31 in the 2nd concession, then southerly on the line between lots 20 and 21 to the southerly limit of the township, including all west of said line, and also including all that portion of the front of said Township of Westminster lying west of the line between lots Nos. 42 and 43, not included in the first division, with that portion of the Township of Caradoc lying south of the line between the 5th and 6th concessions to the River Thames, and with that portion of the Township of Lobo lying south of the line between the 6th and 7th concessions, to the River Thames.

5.—The Township of Ekfrid and Mosa, including the Villages of Wardsville, Newbury and Glencoe.

6.—Townships of Adelaide and Metcalfe, the Town of Strathroy, with that portion of the Township of Caradoc lying north of the line between the 3rd and 4th concessions, with that portion of the Township of Lobo which lies north of the 6th concession and west of the line between lots 12 and 13 of the said township.

7.—The Township of North Doncaster, north and south of the River Thames, that portion of the Township of West Nissouri which lies south of the line between lots 14 and 15, and with that portion of the Township of Westminster lying south of the line between the 1st and 2nd concessions and east of the line between lots 20 and 21 in the 2nd concession and thence east of the line between lots 20 and 21, continued south to the southerly limit of the said Township of Westminster.

8.—All that portion of the Township of London which lies north of the line between the 4th and 5th concessions, that portion of the Township of Lobo which lies north of the line between the 6th and 7th concessions, and east of the line between lots 12 and 13 to the line between the 11th and 12th concessions and with all that portion of the Township of West Nissouri which lies north of the line between lots 14 and 15.

9.—All that part of the City of London lying east of Maitland Street; that part of the Township of London, lying north of the line between the 4th and 5th concessions and east to the said street, produced northerly or in a line in the same direction to the line between the said 4th and 5th concessions and that part of the Township of Westminster lying north of the line between the 1st and 2nd concessions, and east of the main road leading south from Clarke's Bridge across the Thames.

#### DISTRICT OF MUSKOKA.

A. A. Mahaffy, Judge, Bracebridge.

Thomas Johnson, C.A., and C.P., Bracebridge.

1.—The Town of Bracebridge and the Townships of Macauley, McLean, Ridout, Monk and Cardwell, concessions 1, 2, 3, 4, 5, 6, 7, 8 and 9 in the Townships of Stephenson, Brunel and Franklin and that part of the Township of Watt situated east of lot 21, in the several concessions thereof and concessions 7, 8, 9, 10, 11, 12 and 13 in the Townships of Muskoka and Draper.

2.—The Town of Gravenhurst, the Townships of Morrison, Ryde, Wood, Oakley and Baxter, and concessions 1, 2, 3, 4, 5 and 6 of the Townships of Muskoka and Draper.

3.—The Town of Huntsville, the Townships of Stisted, Chaffey and Sinclair, and concessions 10, 11, 12, 13 and 14 in the Townships of Stephenson, Brunel and Franklin.

4.—The Village of Port Carling and the Townships of Freeman, Gibson and Medora and that part of the Township of Watt situated on the west of lot 21 in in the several concessions thereof.

#### DISTRICT OF NIPISSING.

Jos. A. Valin, Judge, North Bay.

H. D. Leask, J.J., North Bay.

T. E. McKee, C.A., and C.P., North Bay.

1. To be composed of all that part of the District which is situated west of the line between the Indian Reserve and the Township of Widdifield produced south to

the boundary of the District, and north of the north-east angle of the Township of Gooderham, and south of the line marking the northern boundary of the said Township of Gooderham produced west to the boundary of the District.

2.—To be composed of so much of the District as lies east of the line commencing at the north-west angle of the Township of Poitras produced to the south-east angle of the Township of French; the Townships of Olrig and Mattawan, and all that part of the District situated east of the line between the Townships of Bonfield and Calvin, produced to the southerly boundary of the District.

3.—To be composed of the Townships of Widdifield, Phelps, Ferris, Chisholm, Ballantyne, Wilkes, Biggar, Paxton, Butt, Devine, Hunter, McCraney, Finlayson, Peck, and all that part of the District situated west of a line drawn from the south-east angle of the Township of French, produced north to the Ottawa River, thence along the Ottawa River to the south-east angle of the Township of South Lorraine, thence west along the south boundary of South Lorraine to the east boundary of the Township of Cassels, thence north along the east boundary of the Township of Cassels, produced northerly to the northern boundary of the District, thence west along the northern boundary of the District to the western boundary thereof, thence southerly along the western boundary to the north-west angle of the Township of Pardeo, thence east along the north boundary of the Township of Pardeo, produced to the north-east angle of the Township of Gooderham; thence southerly along the east boundary of the Township of Gooderham, and the said boundary forwarded to the waters of Lake Nipissing.

5.—To be composed of the Townships of Bonfield and Boulter.

#### NORFOLK.

A. T. Boles, Judge, Simcoe.

T. R. Slaght, C.C.A. and C.P., Simcoe.

1.—The Town of Simcoe, the Gore of the Township of Woodhouse and all that part of said Township lying west of the side line between lots 5 and 6, together with that part of the 4th, 5th and 6th concessions lying west of the said line between lots 12 and 13.

2.—The Township of Townsend and the Village of Waterford.

3.—The Township of Windham.

4.—The Township of Middleton and the Village of Delhi.

5.—The Township of Charlotteville.

6.—The Townships of North Walsingham, South Walsingham and the Village of Port Rowan.

7.—The Township of Houghton.

8.—The Village of Port Dover, and that part of the Township of Woodhouse not included in Division 1, viz.: all that part of the 1st, 2nd and 3rd concession lying east of the side line between lots 5 and 6, and that part of the 4th, 5th and 6th concessions lying east of the said line, between lots 12 and 13 in said township.

#### NORTHUMBERLAND AND DURHAM.

H. A. Ward, Judge, Cobourg.

G. M. Roger, J.J., Cobourg.

W. F. Kerr, C.C.A. and C.P., Cobourg.

1.—Townships of Cartwright and Darlington and the Town of Bowmanville.

2.—Township of Clarke and Village of Newcastle.

3.—Township of Hope and Town of Port Hope.

- 4.—Townships of Cavan, Manvers, South Monaghan and Village of Millbrook.
- 5.—Township of Hamilton and Town of Cobourg.
- 6.—Townships of Haldimand and Altwick.
- 7.—Township of Cramahe and Village of Colborne.
- 8.—Township of Brighton and Village of Brighton.
- 9.—Township of Percy and Village of Hastings.
- 10.—Township of Murray.
- 11.—Township of Seymour and Village of Campbellford.

#### ONTARIO.

T. MacGillivray, Judge, Whitby.

D. J. Melnyre, J.J., Whitby.

J. E. Farewell, C.C.A. and C.P., Whitby.

1.—Including the Townships of Whitby and East Whitby and the Towns of Whitby and Oshawa.

2.—The Township of Pickering.

3.—The Townships of Reach and Scugog and the Village of Port Perry.

4.—The Townships of Uxbridge and Scott and the Town of Uxbridge.

5.—The Township of Brock and the Village of Cannington.

6.—The Township of Thorah and all that part of the Township of Mara lying south of the line between the 4th and 5th concessions.

7.—All that part of the Township of Mara lying north of the line between the 4th and 5th concessions thereof, and the Township of Rama.

#### OXFORD.

Alex. Finkle, Judge, Woodstock.

R. N. Ball, C.A., and C.P., Woodstock.

1.—Comprising the City of Woodstock, the Township of East Oxford, and that part of the Township of East Zorra, lying south of the line between lots number twenty-five and twenty-six of the Township of Blandford, and that part of the Township of North Oxford lying east and north of the road between lots 16 and 17 to the boundary of the Township line between North and West Oxford, and that part of the Township of West Oxford lying east of the road between lots 6 and 7 to the boundary of the Township of East Oxford, and that part of the Township of Blandford lying south of the 10th concession.

2.—Comprises the Township of Blenheim.

3.—Comprises the Township of East Nissouri and West Zorra and the Village of Embro.

4.—Comprises the Townships of North Norwich and South Norwich and the Village of Norwich.

5.—Comprises the Town of Ingersoll and that part of the Township of North Oxford lying west and south of the road between lots No. 16 and 17 of the Township of West Oxford, and that part of the Township of West Oxford lying south of the road between lots 6 and 7 to the line between West Oxford and East Oxford, and those portions of the Township of Dereham being part of the 1st concession of the said Township of Dereham, west of the Middle Town Line.

6.—Comprises the Town of Tillsonburg and that part of the Township of Dereham not included in the Fifth Division.

7.—Comprising the Village of Tavistock and that part of the Township of East Zorra, north of the road between lots 25 and 26, and that part of the Township of Blandford lying north of the 10th concession of the said township.



## DISTRICT OF PARRY SOUND.

F. R. Powell, Judge, Parry Sound.

W. L. Haight, C.A. and C.P., Parry Sound.

1.—The Town of Parry Sound and the Townships of Foley, McDougall, Cowper and Carling, and all that portion of the district lying to the west of the east boundary of Carling, produced to the French River.

2.—The Townships of McKellar, Ferguson, Hagerman, Croft, and all that portion of the district lying between the east boundary of Ferric and the west boundary of Ferguson, produced to the French River.

3.—The Townships of Humphrey, Christie, Monteith and Conger.

4.—Townships of McMurrich, Perry, Armour, Proudfoot and Bethune.

5.—Townships of Spence, Chapman, Ryerson and Lount.

6.—That territory bounded on the west by the western boundaries of the Townships of Pringle and Patterson, and the western boundary of the Township of Patterson, produced to the French River and Lake Nipissing; on the east by the boundary of the District of Parry Sound, and on the south by the southern boundaries of the Townships of Himsworth, Gurd and Pringle.

7.—The Townships of Machar, Laurier, Strong and Joly.

## PEEL.

D. McGibbon, Judge, Brampton.

W. H. McFadden, C.C.A., and C.P., Brampton.

1.—Township of Brampton, Township of Chinguacousy and northern division of the Township of Toronto Gore.

2.—Village of Streetsville, Township of Toronto and southern division of the Township of Toronto Gore.

3.—Township of Caledon.

4.—Village of Bolton, Township of Albion.

## PERTH.

J. A. Barron, Judge, Stratford.

G. G. McPherson, C.C.A., and C.P., Stratford.

1.—To consist of all that part of the Township of North Easthope west of the line between lots 25 and 26, and south of the road between the 8th and 9th concessions, and all that part of the Township of South Easthope west of the side line between lots 25 and 26; all that part of the Townships of Downie and Gore north and east of the concession line between the 10th and 11th concessions and the Oxford Road; and all the Township of Ellice from the 1st to 15th concession, inclusive.

2.—To consist of all that part of the Township of Fullarton not included in Division No. 3, and the Townships of Hibbert and Logan.

3.—To consist of that portion of the Township of Downie west of the Oxford Road, and south of the concession line between the 10th and 11th concessions; the Township of Blanshard; all that part of the Township of Fullarton comprising the 13th and 14th concessions, and south of a road leading from Mitchell Road, between lots 24 and 25, east of lot 3 in the 10th concession; thence east along the line between the 10th and 11th concessions to the town line.

4.—To consist of that part of the Township of North Easthope east of the  
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line between lots 25 and 26, and the north of the 8th concession, inclusive, with the 9th and 10th concessions: all that part of the Township of South Easthope not included in Division 1.

5.—To consist of the Township of Mornington, and all that part of the Township of Elma from lots 13 to 72, both numbers inclusive, of the 1st concession, and from lots 27 to 16, both numbers inclusive, in and from the 2nd to the 18th concession, both concessions inclusive, of the said Township of Elma: and concessions 14, 15 and 16 of the Township of Ellice; and concessions 11, 12, 13 and 14 of the Township of North Easthope.

6.—To consist of the Township of Wallace and all that part of the Township of Elma from the 1st concession to the 18th concession, both concessions inclusive, and comprising lots Nos. 1 to 42, both inclusive, of the 1st concession, and lots Nos. 1 to 26 inclusive from the 2nd to the 18th concession, both concessions inclusive.

### PETERBOROUGH.

E. C. S. Huycke, Judge, Peterborough.

R. E. Wood, C.C.A., and C.P., Peterborough.

1.—Shall comprise the City of Peterborough, the Townships of North Monaghan and Innismore, all the Township of Smith lying south of the 7th concession, all that part of the Township of Otonabee lying west of the 8th concession and north of lots Nos. 21 and all that part of the Township of Douro lying south of lots numbered 11.

Court to be held at the Court House in the City of Peterborough.

2.—Shall comprise the Village of Norwood, the Township of Asphodel, and all that part of the Township of Dummer lying east of the 5th concession and that part of the said Township of Dummer lying west of the 6th concession and south of lots numbered 11. Court to be held in the Town Hall in the Village of Norwood.

3.—Shall comprise that part of the Township of Smith lying north of the 6th concession, all that part of the Township of Douro lying north of lots numbered 10, that part of the Township of Dummer lying west of the 6th concession and north of lots numbered 10, the Township of Galway, the Township of Harvey and the Village of Lakefield. Court to be held in the Town Hall in the Village of Lakefield.

4.—Shall comprise the Townships of Anstruther, Burleigh, Cavendish and Chandos. Court to be held in the Town Hall at Apsley.

5.—Shall comprise the Townships of Belmont and Methuen and the Village of Havelock. Court to be held in the Town Hall in the Village of Havelock.

6.—Shall comprise the Township of Otonabee, except that part thereof lying west of the 8th concession and north of lots numbered 21. Court to be held in the Town Hall, at Keene, in said township.

### PRESCOTT AND RUSSELL.

A. Constantineau, Judge, L'Orignal.

A. Johnston, J.J., L'Orignal.

J. Maxwell, C.C.A., and C.P., L'Orignal.

1.—Comprises the whole of the Township of Longeuil, the municipality of the Village of L'Orignal, and the 1st concession of the Township of Caledonia.

- 2.—Comprising all that part of the Township of West Hawkesbury, extending from front of 3rd concession to the rear of the said township.
- 3.—Comprises the whole of the Township of East Hawkesbury.
- 4.—Comprising the Township of North Plantagenet, and that part of the Township of South Plantagenet lying north of the Nation River.
- 5.—Comprising the whole of the Township of Cumberland.
- 6.—Comprising the whole of the Township of Russell.
- 7.—Comprising the two front concessions of the Township of West Hawkesbury, and the Municipality of Hawkesbury Village, within the same.
- 8.—Comprising the Township of Caledonia (excepting the 1st concession of the said township), and also that portion of the Township of South Plantagenet lying south and east of the Nation River.
- 9.—Comprising the whole of the Township of Alfred.
- 10.—Comprising the whole of the Township of Clarence.
- 11.—Comprising the whole of the Township of Cambridge.

#### PRINCE EDWARD.

D. Morrison, Judge, Picton.

R. H. Hubbs, C.C.A., and C.P., Picton.

1.—The Town of Picton, the 2nd and 3rd concessions of "Military Tract" from the west line of No. 13 eastward; Gore "G": 1st and 2nd concessions north of the Carrying Place, 1st concession southeast of the Carrying Place, and 2nd concession north of Black River, including Gores "K" and "L" and McCan Gores, all in the Township of Hallowell; Block "I" in the concession north and east of East Lake, and Gore "B" in the Township of Athol, and 1st and 2nd concessions south of the Bay of Quinte, and Gore "A" in the Township of North Marysburg, and 1st concession southwest of Green Point to the end of Carman's Point in Sophiasburg.

2.—The Township of South Marysburg, and the Southern part of Athol, commencing at the outlet of East Lake, thence down to the head of the Lake, thence down to the base line between the 1st concession south and the 1st concession north of East Lake, till it strikes the township line of Hallowell, thence down said township line till it strikes South Marysburg.

3.—The Township of Sophiasburg, together with Big Island, excepting the 1st concession southwest of Green Point to the end of Carman's Point.

4.—All that part of the Township of Ameliasburg lying east of the line between lots 86 and 87, in the 1st, 2nd, 3rd and 4th concessions of said township, including Huff's Island.

5.—That part of the Township of Hillier not included in the 7th division, also the first and 2nd concessions north of West Lake, and west of lot No. 7 in the said concession, and that part of Irwin Gore lying north and west of lot No. 7 in the 2nd concession and the west part of the 2nd concession produced west of lot No. 74 in that concession in the Township of Hallowell.

6.—Block (IV.) four, concession south side of West Lake, 1st concession "Military Tract," 2nd and 3rd concessions of said tract west of Lots No. 13, in those concessions, "Gore E," 1st and 2nd concessions north of West Lake, and east of lot No. 6 in those concessions; the Gerrow Gore and that part of Irwin Gore not included in Division No. 8, and all that part of the 2nd concession produced east of lot No. 75 in the Township of Hallowell.

7.—All that part of the Township of Ameliasburg lying west of the line between lots No. 86 and 87, in the 1st, 2nd, 3rd and 4th concessions of said township; all that part of the 4th and 5th concessions of the Township of Hillier west of the



line between lots 86 and 87 and the 3rd concession west of the line between lots No. 22 and 23, with that part of the 2nd concession lying North of Pleasant Bay in the said Township of Hillier.

8.—All the point lying east of the west line of Marshland's Gore, the concession lying North of Smith's Bay and Waupoos Island in the Township of North Marysburg.

### DISTRICT OF RAINY RIVER.

C. R. Fitch, Judge, Fort Frances.

A. D. George, C.A., and C.P., Fort Frances.

1.—To comprise all that part of the said District lying east of the east boundaries of the Townships of Aylesworth, Lash, Carpenter, Kingsford and Fleming, and east of the east boundary of the said Township of Fleming produced north to the north boundary of the said District, to be styled "The First Division Court in the District of Rainy River."

2.—To comprise all that part of the said District lying west of Division No. 1 and east of the east boundaries of the Townships of Morley, Morley Additional, Pattullo, Sifton and Dewart, and east of a line drawn north astronomically from the northeast angle of the said Township of Dewart to the north boundary of the said District, to be styled "The Second Division Court in the District of Rainy River."

3.—To comprise all that part of the said District lying west of Division No. 2, to be styled "The Third Division Court in the District of Rainy River."

### RENFREW.

A. A. Fisher, J.J., Pembroke.

J. H. Barritt, C.C.A., and C.P., Pembroke.

1.—Comprising the Town of Pembroke, the Townships of Pembroke, Stafford, Alice, Petawawa, Buchan, Rolph, Wylie, McKay, Fraser, Herd, Clara and Maria, and all that part of the Township of Wilberforce from the 18th to the 25th concessions, both inclusive, and also those parts of the 14th, 15th, 16th and 17th concessions of the same Township of Wilberforce lying north of Snake River and east of Lake Dore.

2.—Comprising all that part of the Township of Westmeath lying east and north of the Muskrat Lake and River, and all those parts of the Township of Ross, from the 5th to the 9th concessions, both inclusive, east of Muskrat Lake, and from the 7th to the 13th (of the 6th) concessions, both inclusive, of the said Township of Ross.

3.—Comprising the Town of Renfrew and the Townships of Horton, Admaston, Bagot, Blufffield, Brougham and Matawahan, in the said County of Renfrew.

4.—Comprising the Village of Arnprior and the Township of McNab.

5.—Comprising the Townships of Grattan, Sebastopol, South Algoma, North Algoma, and all that part of the Township of Wilberforce, from the 1st to the 17th concessions, both inclusive, excepting those parts of the 14th, 15th, 16th and 17th concessions of said Township of Wilberforce lying north of Snake River and east of Lake Dore.

6.—Comprising the Township of Bromley, and all that part of the Township of Westmeath west of Muskrat Lake, and all those parts of the Township of Ross, from the 1st to the 14th concessions, both inclusive, of the said Township of Ross.

7.—Comprising the Townships of Brudenell, Radcliffe, Raglan, Lynedoch, Griffith, Hagarty, Sherwood, Jones, Richards and Burns.



## SIMCOE.

G. N. Vance, Judge, Barrie.

E. A. Wismer, J.J., Barrie.

J. R. Cotter, C.C.A., and C.P., Barrie.

1.—Comprising the Town of Barrie, the Township of Vespra, except that portion lying west of the Nottawasaga River, and excepting also lots Nos. 38, 39 and 40, in the 1st and 2nd concessions, and lots Nos. 1, 2 and 3 in the 3rd, 4th, 5th, 6th and 7th concessions respectively. That portion of the Township of Oro lying south of lots Nos. 21 in the 1st and 2nd concessions (including the ranges), and south of lots Nos. 13 in the 3rd, 4th, 5th, 6th, 7th and 8th concessions respectively; that portion of the Township of Innisfil lying east of lots Nos. 5 in the 6th, 7th and 8th concessions, and that portion lying north of the 8th concession: that portion of the Township of Essa lying north of lots Nos. 19 in the 7th, 8th, 9th, 10th and 11th concessions.

2.—The Village of Bradford, the Township of West Gwillimbury, excepting thereout lots Nos. 1, 2, 3, 4 and 5 in the 14th and 15th concessions; the Township of Innisfil, excepting that portion lying north of the 5th concession, and excepting also lots Nos. 1, 2, 3, 4, and 5 in the 1st, 2nd, 3rd, 4th and 5th concessions thereof.

3.—The Township of Tecumseh, excepting concessions 12, 13, 14 and 15; the Township of Adjala, excepting that portion lying north of lot No. 25 in the 8th concession thereof.

4.—The Town of Collingwood, the Village of Stayner, that portion of the Township of Nottawasaga lying north of lot No. 18 in the 12th concession thereof; that portion of the Township of Summisdale lying north of the 8th concession: that portion of the Township of Floss lying west of the Nottawasaga River; the islands in Lake Huron contiguous to the Township of Nottawasaga.

5.—The Township of Floss, except that portion lying west of the Nottawasaga River; the Township of Medonte, except that portion lying east of the 10th concession and north of lots Nos. 19 in the 9th and 10th concessions respectively; that portion of the Township of Oro lying north of the southern boundaries of lots Nos. 21 in the 1st and 2nd concessions, and north of the southern boundaries of lots Nos. 13 in the 3rd, 4th, 5th, 6th, 7th and 8th concessions respectively; lots 38, 39 and 40 in the 1st and 3rd concessions, and lots Nos. 1, 2 and 3 in the 3rd, 4th, 5th, 6th and 7th concessions of the Township of Vespra.

6.—The Town of Orillia, the Township of Orillia, southern division, the Township of Orillia, northern division, except that portion lying north of lots Nos. 15 in the first seven concessions thereof: that portion of the Township of Oro lying east of the 8th concession: that portion of the Township of Medonte, being composed of lots Nos. 1 to 6 (both inclusive) in the 11th, 12th, 13th, and 14th concessions; the islands in Lake Simcoe contiguous to the townships and portions of townships above described lying wholly or for the most part opposite thereto.

7.—The Township of Nottawasaga, except that portion lying north of lot No. 18 in the 12th concession thereof: the Township of Summisdale, except that portion lying north of the 8th concession: that portion of the Township of Vespra lying west of the Nottawasaga River: that portion of the Township of Essa lying north of lots 19 in the 1st, 2nd, 3rd, 4th, 5th and 6th concessions: that portion of the Township of Tossorontio lying north of lots Nos. 20 in each of the seven concessions thereof.

8.—The Township of Essa, except that portion lying north of lots Nos. 19 in each of the eleven concessions thereof; the Township of Tossorontio, except that

portion lying north of lots No. 20 in each of the seven concessions thereof; that portion of the ownship of Innisfil, being composed of lots Nos. 1, 2, 3, 4 and 5 in the 1st, 2nd, 3rd, 4th, 5th, 6th, 7th and 8th concessions; the 12th, 13th, 14th and 15th concessions of the Township of Tecumseh; lots Nos. 1, 2, 3, 4 and 5 in the 14th and 15th concessions of the Township of West Gwillimbury; that portion of the Township of Adjala lying north of lots Nos. 25 in the eight concessions thereof.

9.—The Town of Penetanguishene and the Village of Midland, the Township of Tiny; that portion of the Township of Tay lying west of the 8th concession; the islands in Lake Huron contiguous to the Township of Tiny, and to that part of the Township of Tay, forming part of the 9th division, and lying wholly and for the most part opposite thereto.

10.—The Township of Matchedash, that portion of the Township of Orillia, northern division, lying north of lots Nos. 15, in the first seven concessions thereof; that portion of the Township of Medonte lying north of lots Nos. 6, in the 11th, 12th, 13th and 14th concessions, and that portion lying north of lots Nos. 10, in the 9th and 10th concessions thereof; the Township of Tay, except that portion lying west of the 8th concession: the island in Lake Huron, contiguous to that portion of the Township of Tay, forming part of the 10th division, and lying wholly or for the most part opposite thereto.

NOTE.—Each of the said several divisions shall include all allowances for roads embraced within its external limits, and shall also extend to the centre of every allowance for road lying external and adjacent to every such division, excepting always where any such last-mentioned allowance is hereinbefore declared to belong to or form part of any particular division.

#### STORMONT, DUNDAS AND GLENGARRY.

J. R. O'Reilly, Judge, Cornwall.

J. W. Liddell, J.J., Cornwall.

Jas. Dingwall, C.C.A., and C.P. Cornwall.

1.—Township of Charlottenburg, in the County of Glengarry.

2.—Township of Lochiel, in the County of Glengarry.

3.—Township of Cornwall, in the County of Stormont.

4.—Township of Osnabruck, in the County of Stormont.

5.—Township of Williamsburg, in the County of Dundas.

6.—Township of Matilda, in the County of Dundas.

7.—Township of Mountain, in the County of Dundas.

8.—Township of Finch, in the County of Stormont.

9.—Township of Lancaster, in the County of Glengarry.

10.—Township of Winchester, in the County of Dundas.

11.—Township of Roxborough, in the County of Stormont.

12.—Township of Kenyon, in the County of Glengarry.

#### SUDBURY.

J. J. Kehoe, Judge, Sudbury.

R. R. McKessock, C.A., and C.P., Sudbury.

1.—To comprise so much of the District as lies east of a line commencing at the south-west angle of Township No. 82 produced north to the north-west angle of Township of Fairbank, thence east to the south-east angle of the Township of Rayside, thence north to the northern boundary of the District, thence east along

the northern boundary of the District to the north-east angle of the Township of Ellis, thence south along the eastern boundary of the said township produced to the southern boundary of the District.

2.—So much of the District as lies north of a line produced westerly from the south-east angle of the Township of Rayside to the western boundary of the said District.

3.—So much of the District as lies west of a line produced north from the south-east angle of Township No. 82 to the north-west angle of the Township of Fairbank, thence west to the boundary of the said District.

4.—So much of the District as lies east of a line between the Townships of Allen and Bigwood, produced north to the northern boundary of the District.

### DISTRICT OF TEMISKAMING.

H. Hartman, Judge, Haileybury.

F. L. Smiley, C.A. and C.P., Haileybury.

1.—To be composed of that portion of the District lying south of the northerly boundary of the Townships of Klock, Barr, Firstbrook, and Bucke, and east of the line between the Townships of Van Nostrand and Klock, produced southerly to the boundary of the District.

2.—To be composed of the Townships of Cane, Henwood, Kerns, Harley, Casey, Auld, Lundy, Hudson, Dymond, Harris, Hilliard and Brethour, and the Town of New Liskeard.

3.—To be composed of that part of the District that lies north of the northern boundary of the Townships of Cane, Henwood, Kerns, Hilliard and Brethour and east of the boundary line between the Townships of Tudhope and Bryce, produced northerly to the north-west angle of the Township of Bernhardt, thence east to the boundary of the District.

4.—To be composed of so much of the District as lies south of the southerly boundary of the Township of Langmuir produced easterly to the north-west angle of the Township of Bernhardt, and west of the line between the Townships of Maisonville and Bernhardt, produced southerly to the southern boundary of the District.

5.—So much of the District as lies west of a line produced north from the south-east angle of the Township of Geikie, to the boundary of said District.

6.—To be composed of that portion of the District lying north of the southerly boundary of the Township of Langmuir, produced easterly to the eastern boundary of the District.

### THUNDER BAY DISTRICT.

H. H. O'Leary, Judge, Port Arthur.

Jno. McKay, J.J., Port Arthur.

W. F. Langworthy, C.A., and C.P., Port Arthur.

1.—All that part of the district lying west of the meridian of 87 degrees of west longitude, to the meridian of the most easterly part of Hunter's Island, excepting therefrom the Municipality of Neebing.

3.—Comprising the Municipality of Neebing.



## VICTORIA.

J. E. Harding, Judge, Lindsay.

H. McMillan, J.J., Lindsay.

A. P. Devlin, C.C.A., and C.P., Lindsay.

1.—The first consists of the following townships and parts of townships, viz.: Of the 15th concession of the Township of Mariposa, and the Township of Eldon, except the ranges north and south of the Portage Road.

2.—All the Township of Fenelon, except that portion lying east of the Scugog River, and south of Sturgeon Lake, and the Township of Somerville.

3.—The Township of Verulam.

4.—The Township of Emily.

5.—The Town of Lindsay, Township of Ops, and that portion of the Township of Fenelon, lying east of the Scugog River, and south of Sturgeon Lake.

6.—The Township of Mariposa, except the 15th concession.

7.—The Townships of Camden and Dalton, Laxton, Digby and Longford, and the Township of Bexley, and that portion of the Township of Eldon north of Portage Road, and the range south of Portage Road.

## WATERLOO.

C. R. Hanning, Judge, Berlin.

W. M. Reade, J. J., Berlin.

W. H. Bowlby, C.C.A., and C.P., Berlin.

1.—All that portion of the Township of Waterloo lying north of Blockline on the west side of the Grand River and that part of the upper block of said township lying north of said township lying on the east side of the Grand River, north of lots Nos. 115, 109, 104, 86 and 95, to the Guelph Township line, including the Towns of Berlin and Waterloo.

2.—All that part of the Township of Waterloo lying south of the Blockline on the west side of the Grand River, and that part lying on the east side of the Grand River, south of the northern boundary of lots Nos. 115, 109, 104, 85 and 95, to the Guelph Township line, including the Villages of Preston and Hespeler.

3.—All that portion of the Township of North Dumfries lying east of lot No. 19 in the 7th concession, and running a course with the eastern boundary of the said lot in a northerly direction up to the 12th concession; thence along the eastern boundary of lot No. 23, in the said 12th concession, to the township line, including the Town of Galt.

4.—The Township of Wilmot, including the Village of New Hamburg.

5.—The Township of Wellesley.

6.—The Township of Woolwich.

7.—All that part of the Township of North Dumfries lying west of the eastern boundary of said lot No. 19, in the 7th concession; thence along the eastern limits of the said lot No. 19, the same course thereof, in a northerly direction to the 15th concession; thence along the westerly limit of lot No. 23, in the said 12th concession to the township line, including the Village of Ayr.

## WELLAND.

L. B. C. Livingstone, Judge, Welland.

T. D. Cowper, C.C.A., and C. P., Welland.

1.—The Township of Crowland; that part of the Township of Thorold lying south of the lines between lots 178 and 195, running through to Pelham; that part



of Pelham lying south of the 4th concession, and that part of Humberstone lying north of the concession line, between the 4th and 5th concessions, being the whole of the 15th concession and the Town of Welland.

2.—The Township of Wainfleet.

3.—The Township of Bertie, and those parts of the Township of Humberstone not included in Nos. 1 and 6, and the Village of Fort Erie.

4.—The Township of Willoughby, the Village of Chippawa, and that part of the Township of Stamford south of the line between lots 136 and 137; easterly from the westerly limit of the township to the southeast angle of lot No. 133; thence north on the line between lots Nos. 132 and 133, to the northern boundary of the township, including the towns of Clifton and Navy Island.

5.—Those parts of the Township of Stamford, Thorold and Pelham not included in any other division, and the Town of Thorold.

6.—All the Township of Humberstone lying south of the 5th concession, and west of the side lines between lots Nos. 9 and 10, in the several other concessions thereof, and the Village of Port Colborne.

### WELLINGTON.

L. M. Hayes, Judge, Guelph.

A. Spotton, J.J., Guelph.

A. H. Macdonald, C.C.A., and C.P., Guelph.

1.—The Town and Township of Guelph.

2.—The Township of Puslinch.

3.—The Township of Eramosa.

4.—The Township of Nichol, excepting the 11th and 12th concessions; the Municipality of Fergus; the first eight concessions of the Township of Garafraxa; and lots 1 to 18, both inclusive, in concessions A and B of the Township of Peel, lots 13, 14, 15, 16, 17 and 18, in concessions 18 and 19, and lots 19, 20 and 21 in the 17th concession of the Township of Peel.

5.—The Township of Erin.

6.—The Township of Pilkington, and the 11th and 12th concessions of the Township of Nichol; the Municipality of the Village of Elora, and lots Nos. 19 and upwards belonging to the 9th, 10th, 11th, 12th, 13th, 14th, 15th and 16th concessions of Peel.

7.—Concessions 1 to 16, inclusive, of the Township of Maryboro' and concessions 1 to 16, inclusive, of the Township of Peel, except lots 19, 20, 21, 22 and 23 of those concessions in that township.

8.—That part of the Township of Arthur south and southeast of lot 15, on the west side of the Owen Sound Road, in the Township of Arthur; that part of the Township of Luther from 1 to 16, both inclusive; and lots 1 to 12, both inclusive, of the 17th and 18th concessions of the Township of Peel; lots 5 to 11, both inclusive, of the 19th concession of said Township of Peel; and lots 19 to 23, both inclusive, of concessions A and B of said Township of Peel.

9.—The territory formerly comprised in this division is now in the County of Dufferin.

10.—The Township of Minto.

11.—The Town of Mount Forest, and that part of the Township of Arthur north of lot 16, west of the Owen Sound Road; lot 17, on the Owen Sound Road, and lot 13, east of the Owen Sound Road.

## WENTWORTH.

C. G. Snider, Judge, Hamilton.

J. F. Monck, J.J., Hamilton.

S. F. Washington, C.C.A., and C.P., Hamilton.

1.—All that part of the Township of Barton lying east of the lines between lots 14 and 15, and all that part of Hamilton City east of Hughson street.

2.—The whole of the Township of Flamboro' West, the Town of Dundas, and the east half of the Township of Ancaster.

3.—The whole of the Township of Flamboro' East.

4.—The whole of the Township of Beverly and the west half of the Township of Ancaster.

5.—The whole of the Township of Saltfleet.

7.—The whole of the Township of Glanford.

8.—The whole of the Township of Binbrook.

9.—All that part of the Township of Barton lying west of the lines between lots 14 and 15, and that part of Hamilton City west of Hughson street.

## YORK.

John Winchester, Judge, Toronto.

E. Coatsworth, J.J., Toronto.

F. M. Morson, J.J., Toronto.

J. H. Denton, J.J.

R. H. Greer, C.C.A., Toronto.

H. E. Irwin, C.P., Toronto.

Toronto City.—Crown Attorney, J. W. Seymour Corley.

1.—The City of Toronto east of Yonge street, at date 14th September, 1875 (*i.e.*, Bloor, Sherbourne and Howard streets on the north, the Don on the east, down to Queen street, and south of Queen street as far as Lee avenue).

2.—Concessions 5 to 11, inclusive, of the Township of Markham, and concessions 5 to 10, inclusive, of the Township of Whitechurch, from 1 to 10, inclusive, together with the Villages of Markham and Stouffville.

3.—Concessions 1 to 4, inclusive, of the Township of Markham, and concessions 1 to 4, inclusive, of the Township of Whitechurch, from lots 1 to 10, inclusive, and concessions 1 to 3, inclusive, of the Township of Vaughan.

4.—The Township of Whitechurch, from the line between lots 10 and 11 northward; and the Township of East Gwillimbury.

5.—The Townships of Georgina and North Gwillimbury.

6.—The Townships of King and the incorporated Village of Aurora.

7.—Concessions 4 to 11, inclusive, of the Township of Vaughan.

8.—All that portion of the Township of York lying west of Yonge street, and the Township of Etobicoke.

9.—Township of Scarboro' and all that portion of the Township of York which lies east of Yonge street and the Village of Leslieville.

10.—The City of Toronto, west of Yonge street, at date of 10th September, 1875 (*i.e.*, Bloor street on the north and Dufferin street on the west).

## DIVISION COURT TARIFF.

## Form I.

## 1.—CLERK'S FEES.

1. Receiving claim, numbering and entering in procedure book .....	\$0 25
(This item to apply to entering in the procedure book a transcript of judgment from another Court but not an entry made for the issue of a judgment summons.)	
2. Issuing summons, with necessary notices and warnings thereon, or judgment summons (as provided in forms) in all.	
Where claim exceeds \$10 and does not exceed \$20 .....	50
Where claim exceeds \$20 and does not exceed \$60 .....	60
Where claim exceeds \$60 and does not exceed \$100 .....	80
Where claim exceeds \$100 .....	1 50
(N.B.—In replevin and interpleader suits the value of goods to regulate the fee.)	
3. Copy of summons, including all notices and warnings thereon .....	25
4. Copy of claim (including particulars), when not furnished by plaintiff..	25
5. Copy of set-off or counterclaim or notice of defence (including particulars), when not furnished by defendant .....	25
(Note.—In either of the last two preceding items the fee may be taxed against the party ordered to pay costs.)	
6. Receiving and entering bailiff's return to any summons, writ or warrant issued under the seal of the Court (except summons to witness and return to summons or paper from another division) .....	15
7. Taking confession of judgment .....	10
(This does not include affidavit and oath, chargeable under item 8.)	
8. Every necessary affidavit, if actually prepared by the clerk, and administering oath to the deponent .....	25
9. Furnishing duly certified copies of the summons and notices and papers with all proceedings, for purposes of appeal, as required by either party, per folio of 100 words .....	05
10. Certificate therewith .....	25
11. Certifying under seal of the Court and delivering to a judgment creditor a memorandum of the amount of judgment and costs against a judgment debtor, or garnishee, under The Creditor's Relief Act, or for any other purpose .....	25
12. Copies of papers, for which no fee is otherwise provided, necessarily required for service or transmission to the Judge, each .....	10
If exceeding two folios, per folio .....	05
13. Every notice of defence or admission entered, or other notice required to be given by the Clerk to any party to a cause or proceeding, including mailing, but not postage .....	15
14. Entering final judgment by Clerk, on special summons, where claim not disputed.	
Where claim does not exceed \$60 .....	50
Where claim exceeds \$60 .....	75

15. Entering every judgment rendered at the hearing, or final order made by the Judge.	
Where claim does not exceed \$60 .....	50
Where claim exceeds \$60 .....	75
(Note.—This fee does not apply to any proceeding on judgment summons.)	
(These fees will include the service of recording at the trial and afterwards entering in the procedure book the judgment, decree and order in its entirety, rendered or made at the trial. If a garnishee proceeding before judgment, these fees will be allowed for the judgment in respect to the primary debtor, and like fees for the adjudication, whenever made, in respect to the garnishee.)	
16. Subpoena to witness .....	25
(The subpoena may include any number of names therein and only one original subpoena shall be taxed, unless the Judge otherwise orders.)	
17. For every copy of subpoena required for service .....	10
18. Summons for jury (including copy for each jurymen), when required by parties .....	1 25
19. Calling and returning jury ordered by the Judge .....	25
20. Every order of reference, or order for adjournment, made at hearing, and every order requiring the signature of the Judge, and entering the same, including final order on judgment debtor's examination..	25
(Any warning necessary with order forms part of the order.)	
21. Transcript of judgment to another Division Court .....	50
22. Every writ of execution, warrant of attachment, or warrant of commitment, and delivering same to bailiff.	
Where claim does not exceed \$60 .....	50
Where claim exceeds \$60 and does not exceed \$100 .....	75
Where claim exceeds \$100 .....	1 00
23. Renewal of every summons or writ of execution, when ordered by the judgment creditor, or warrant of commitment, when ordered by Judge .....	25
24. Every bond, when necessary, and prepared by the Clerk (including affidavits of justification and of execution) .....	1 00
25. Transmitting transcript of judgment; or transmitting papers for service to another division; or to the Judge, on application to him, including necessary entries and mailing, but not including postage .....	25
26. Receiving papers from another division for service, entering the same, handing to the bailiff, receiving and entering his return and transmitting the same (if return made promptly, not otherwise) .....	30
27. Search by a person not a party to the suit or proceeding to be paid by the applicant .....	10
Search by a party to the suit or proceeding, where the suit or proceeding is over one year old .....	10
(No fee is chargeable for search to a party to the suit or proceeding, if the same is not over one year old.)	
28. Taxing costs, in defended suits, after judgment pronounced .....	25
29. Making out statement of costs in detail (including bailiff's fees) at the request of any party .....	10



(Neither item 28 nor 29 applies to statement of costs endorsed on summons or copy to be served.)

30. Taxing bailiff's costs, under section 179 of the Division Courts Act . . .	25
31. Every necessary letter written to any party to any cause, matter or proceeding in the court . . . . .	15
(A letter shall not be considered necessary when a notice contains the same information.)	

## 2.—BAILIFF'S FEES.

1. Service of summons issued under the seal of the Court, or Judge's summons or order on each person, except summons to witness and summons to juryman:	
Where claim exceeds \$10 and does not exceed \$20 . . . . .	\$0 40
Where claim exceeds \$20 and does not exceed \$60 . . . . .	50
Where claim exceeds \$60 and does not exceed \$100 . . . . .	75
Where claim exceeds \$100 . . . . .	1 00
(In interpleader suits the value of the goods to regulate the fee.)	
2. For every return as to service under item 1; attending at the clerk's office and making the necessary affidavit . . . . .	15
3. Service of summons on witness or juryman, or service of notice . . . . .	25
4. Taking confession of judgment and attending to prove . . . . .	10
5. For calling parties and their witnesses at the sitting of the court in every defended case, and at the hearing of every judgment summons. . . . .	15
6. Enforcing every writ of execution or summons of replevin, or warrant of attachment or warrant against the body, each:	
Where claim does not exceed \$20 . . . . .	65
Where claim exceeds \$20 and does not exceed \$60 . . . . .	1 00
Where claim exceeds \$60 . . . . .	1 50
(Where goods replevied, the value of goods to regulate the amount of the fee. This fee does not include service of summons in replevin on defendant.)	
Fees under Creditor's Relief Act (see section 188 of 10 Edw., cap. 32; and section 26 of R.S.O. cap. 48, 9 Edw. VII.) shall be taxed according to the tariff.	
7. Every mile or fraction of a mile necessarily travelled to serve summons, or process, or other necessary papers, or in going to seize on a writ of execution, where money, paid on demand, or made on execution, or case settled after seizure . . . . .	15
8. Mileage going to arrest under warrant, when arrest made, per mile or fraction of a mile . . . . .	15
9. Mileage carrying delinquent to prison, including all expenses and assistance, per mile, or fraction of a mile . . . . .	25
10. Every schedule of property seized, attached, or replevied, including affidavit of appraisal, when necessary:	
Exceeding \$10 and not exceeding \$20 . . . . .	30
Exceeding \$20 and not exceeding \$60 . . . . .	50
Exceeding \$60 . . . . .	75
11. Every bond, when necessary, when prepared by the bailiff, including affidavit of justification and execution . . . . .	1 00

12. Every notice of sale, not exceeding three, under execution, or under attachment, each ..... 25
13. Reasonable allowances and disbursements, necessarily incurred in the care and removal of property:
- (a) If a bailiff removes property seized, he is entitled to the necessary disbursements, in addition to the fees for seizure and mileage.
  - (b) If he takes a bond, then to \$1.00 instead of disbursements for removal of property.
  - (c) If assistance is necessary in the seizure, or securing, or retaining of property, the bailiff is entitled to the disbursements for such assistance.
  - (d) All charges for disbursements are to be submitted to the clerk for taxation, subject to appeal to the Judge.
  - (e) The bailiff must in all cases endorse a memorandum of all his charges on the back of the execution, or state them on a separate slip of paper, so that the clerk may conveniently tax the bailiff's charges for fees and disbursements.
  - (f) The Clerk in all cases to sign the memorandum of his taxation and preserve it among the papers in the cause, together with the execution, for future reference, and thereby enable the clerk to certify the bailiff's returns properly.
14. If execution or process in attachment in the nature of execution be satisfied in whole or in part, after seizure and before sale, whether by action of the parties or otherwise, the bailiff shall be entitled to charge and receive 3 per cent. on the amount directed to be levied; or on the amount of the value of the property seized, whichever shall be the lesser amount.
15. Poundage on executions, and on attachments in the nature of executions, 5 per cent., exclusive of mileage for going to seize and sell, upon the amount realized from property necessarily sold.

### 3.—FEES TO WITNESSES AND APPRAISERS.

#### Allowances to Witnesses.

Attendance, per diem, to witnesses within three miles of the place where the Court is held, if within the county .....	\$ 75
And if without the county .....	1 00
Attendance, if witness resides over three miles from the place of sittings and within the county, per diem .....	1 00
Attendance, if witness resides without the county and more than three miles of the place of sittings, per diem .....	1 25
Barristers and solicitors, physicians and surgeons, engineers and veterinary surgeons, other than parties to the cause, when called upon to give evidence of any professional service rendered by them, or to give professional opinions, per diem .....	4 00

(Note.—Disbursements to surveyors, architects and professional witnesses, such as are entitled to specific fees, by statute, are to be taxed, as authorized by such statute.

If witnesses attend in one case only, they will be entitled to the full allowance.  
If they attend in more than one case, they will be entitled to a proportional part in each case only.)  
The travelling expenses of witnesses, over three miles, shall be allowed according to the sums reasonably and actually paid, but in no case shall exceed 20 cents per mile, one way.

FEES OF APPRAISERS.

Fees to Appraisers of Goods, etc., seized under Warrant of Attachment.  
To each appraiser, \$1.00 per day, during the time actually employed in appraising goods—to be paid in the first instance by plaintiff and allowed as costs in the cause.

FEES IN SUITS NOT EXCEEDING \$10.

(Section 48, D.C. Act.)

Clerk.

For all services, from entering action, or suing out a judgment or interpleader summons, up to and including the entering of final judgment, or final order on any such judgment or summons, in case the action proceeds to judgment or final order .....	1 25
In case the action does not proceed to judgment or final order, the fees heretofore, or that may hereafter be payable, but not exceeding in the whole the said sum.	
For issuing writ of execution, warrant of attachment, or warrant for arrest of delinquent and entering the return thereto .....	50

Bailiff.

For all services rendered in serving summons and making return, and any other service that may be necessary before the judgment is entered by the clerk or pronounced by the Judge, mileage excepted .....	50
For enforcing execution, schedule of property seized, or attached, bond where necessary, and all other necessary acts done by him, after seizure, mileage excepted, if money made or case settled, after levy..	1 00
(Necessary disbursements incurred in the care and removal of property shall be allowed to be first allowed by the clerk, subject to the approval of the Judge.)	





REPORT  
OF THE  
Inspector of Legal Offices  
ONTARIO  
1913

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PRINTED BY ORDER OF  
THE LEGISLATIVE ASSEMBLY OF ONTARIO

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*To His Honour* SIR JOHN MORISON GIBSON, K.C.M.G., etc., etc., etc.,

*Lieutenant-Governor of the Province of Ontario.*

MAY IT PLEASE YOUR HONOUR:

The undersigned begs respectfully to present to Your Honour the Thirty-first Annual Report of the Inspector of Legal Offices for the year ending 31st day of December, 1913.

J. J. FOY,

*Attorney-General.*

TORONTO, March 31st, 1914.





# REPORT

## OF THE

### Inspector of Legal Offices, 1913

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To His Honour SIR JOHN MORISON GIBSON, K.C.M.G., etc., etc., etc.

*Lieutenant-Governor of the Province of Ontario.*

SIR,—I have the honour to present the Thirty-first Annual Report of the Inspector of Legal Offices upon the affairs of the Judicial Offices of the Province for the year ending December 31st, 1913.

The Statute 2 George V, chapter 21, whereby the Provisional Judicial District of Temiskaming was formed from portions of the territory comprising the Districts of Sudbury and Nipissing, came into force on January 28th, 1913, by Proclamation dated January 25th, 1913, (Ontario Gazette, February 1st, 1913).

By Orders-in-Council, dated May 16th, 1913, officers of the Supreme, District and Surrogate Courts were appointed. These I visited twice during the year at their offices in Haileybury, gave them necessary instructions, and saw that they were provided with seals of office, and all necessary books and supplies.

A list of officers appointed during the year, with the date of the Ontario Gazette in which each appointment was published, will be found in Appendix "N" to this Report.

#### SHERIFFS.

By Section 41 of the Sheriffs' Act (R.S.O. chapter 16) a Sheriff who is not paid wholly or in part by salary, and whose net income for the year does not exceed the sum of \$1,500.00, may, on the report of the Inspector of Legal Offices, be paid out of the Consolidated Revenue Fund an amount sufficient to make up his income for the year to \$1,500.00. Nineteen of the Sheriffs are entitled to payments under this Statute for the year 1913.

Their duties were generally well performed, but in some instances I found items omitted from their Fee Books, and a want of care in the preparation of their returns.

Section 5 of The Public Officers Fees Act (R.S.O. chapter 17) provides that every Sheriff shall be entitled to retain to his own use in each year his net income up to \$6,500, but shall pay to the Province of Ontario 90 per cent. of the excess over that sum. During 1913, two sheriffs came within the provisions of this enactment.

Appendix "A" sets out in tabulated form the statistical returns of the Sheriffs for the year 1913.

## LOCAL MASTERS.

The duties of these officers were well performed; the amount of business in these offices, however, is not large.

In Appendix "B" is set out in tabulated form the Statistical returns of the Local Masters for the year 1913.

## LOCAL REGISTRARS, DEPUTY REGISTRARS, DEPUTY CLERKS OF THE CROWN, COUNTY AND DISTRICT COURT CLERKS.

The Rules prepared by Mr. Justice Middleton under instructions from the Honourable the Attorney-General came into force on September 1st, 1913. A draft of these rules was distributed accompanied by an explanatory circular in which the more important changes and the reasons for the change were pointed out. I am reprinting this circular as an appendix, trusting that it may be of interest and use to the officers. It appears as Appendix "L" to this Report.

Difficulty has been experienced in securing uniformity in the details of practice, and in order to have such matters dealt with in an authoritative way, a resolution was passed by the Judges of the Supreme Court at a meeting held December 24th, 1913, that the Chief Justice of Ontario, Mr. Justice Middleton, and Mr. Justice Kelly be a Committee with authority to give any instructions necessary for the guidance of officers, so as to secure uniformity of practice and the due despatch of business; and that this Committee report any amendments to the Rules that may be found desirable.

New Rules were adopted at this meeting, copies of which, as well as of the Rules passed by the Judges at their meeting held September 15th, 1913, I caused to be furnished to the officers.

On the coming into force of the new rules many questions were submitted to me. Some of the answers given are as follows:—

There are no fees for filings, nor on orders, in County Court actions.

Two dollars is the fee for a concurrent writ in the Supreme Court. There is no fee for a concurrent writ issued in the County Court.

One dollar is the fee for a Commission from the Supreme Court (see Tariff item "writs other than writs of summons" at page 209). There is no fee for a Commission from the County Court.

There is no fee in either the Supreme or County Courts for issuing a Third Party Notice. For the appearance to a Third Party Notice, in either of these Courts, the fee is \$1.00.

Subpoenas (*ad Test, or duces Tecum*) issued out of the Supreme Court require a \$1.00 law stamp. They are writs. There is no fee for these in County Court actions. In matters other than actions a fee of \$1.00 is payable on subpoenas issued from County Courts.

There is no fee now payable in respect of the Shorthand Reporters' Fund. The \$6.00 mentioned at page 208 of the Tariffs is payable, \$3.00 in law stamps, and \$3.00 in cash. The stamps should be affixed to the Praeceptum for entry, the cash is for the Jury fee and must be paid to the County Treasurer (in the Provisional Judicial Districts to the Provincial Treasurer) at the end of each sittings.

In County Court cases the fee for entry of an action is \$5.00 (page 211 of the Tariffs) but as this does not include the Jury Fee, an additional \$1.50 under

the Jurors Act is to be collected, which must likewise be paid over to the County or Provincial Treasurer.

When the proceedings in Mechanics' Lien Actions are taken before a Local Master, whose fees have not been commuted, the fees payable under Section 41 of the Mechanics' and Wage-earners' Lien Act (R.S.O. cap. 140) are payable to the Master in cash. The fees mentioned in sub-section 1 of said section should therefore be collected by the Local Registrar in cash, when the Statement of Claim is filed, and by him paid to the Local Master.

In a few offices the Jury fees had not been paid over, and in some I found Chattel Mortgages, Bills of Sale and Lien notes not entered. In one the Indices were all in arrears, and in three I found law stamps aggregating \$24.80 missing from suit papers. These, however, were the exceptions; as a rule the work of these officers is efficiently done and entries in their books promptly and correctly made.

Appendix "C" is a return of the business of the High Court Division of the Supreme Court of Ontario in the offices of the Local Registrars, Deputy Registrars, and Deputy Clerks of the Crown; while Appendix "D" is a return of the business in the Offices of the Clerks of the County and District Courts, for the year 1913.

#### SURROGATE REGISTRARS.

New Tariffs of fees payable to Solicitors and Registrars on proceedings in the Surrogate Courts, prepared by the Board of County Judges, and adopted by the Judges of the Supreme Court, came into force on March 16th, 1914, printed copies of which I have sent to the Surrogate Judges and Registrars of the Province.

Under the tariff of Solicitor's fees, increased allowances are in some cases permitted subject to the approval of a Judge of the Supreme Court. To secure uniformity it has been arranged that, until further direction is given, all applications shall be heard by Mr. Justice Middleton. The certificate of the Surrogate Judge and all papers necessary to enable the matter to be dealt with should be forwarded to him at Osgoode Hall (with return postage). If any notice is deemed necessary it will be sent to the parties by mail.

The fee sheet accompanying the order for Grant made by the Surrogate Judge, and which in every case should be attached to the papers leading to grants of Probate, Administration and Guardianship, I have carefully revised, so as to have it conform with the new Tariff and the Schedules to the Surrogate Act; and in order to secure uniformity, and so that the Registrars may have it as a guide when ordering forms, I am inserting it as Appendix "M" to this Report.

As a general rule the Surrogate Registrars are careful and painstaking in the discharge of their duties. In some offices, however, I found the copying in arrears, and in four the papers were not sufficiently stamped. The amount due the Crown in this connection was \$70.20, for which I caused law stamps to be affixed to the papers and cancelled.

Appendix "E" gives in tabulated form the business of the Surrogate Registrars for the year 1913.

#### COUNTY AND DISTRICT CROWN ATTORNEYS AND CLERKS OF THE PEACE.

Some Crown Attorneys have not complied with the Order-in-Council of November 12th, 1912, anent fines, penalties, and forfeited recognizances, in that



they have failed to close their accounts on the 31st day of October in each year, and to make returns for the quarters ending January 31st, April 30th, July 31st, and October 31st in each year. A cheque, made payable to the Hon. the Provincial Treasurer, should accompany each return, for the amount of the fines, etc., then on hand, less the commission allowed by the Order-in-Council.

#### GENERAL REMARKS.

The Provisions of the Law Reform Act, 1909, whereby the Divisions and Divisional Courts of the High Court of Justice were abolished, and two branches or divisions of the Supreme Court constituted, to be known as and designated respectively, The Appellate Division of the Supreme Court of Ontario, and The High Court Division of the Supreme Court of Ontario, came into force on the first day of January, 1913, by Proclamation dated July 4th, 1912, published in the issue of the Ontario Gazette, of July 6th, 1912.

In Appendix "G" to this report I have set out the more important business of the High Court Division of the Supreme Court of Ontario transacted at Toronto, during the year 1913, compiled from statements received from the officers in Osgoode Hall.

Appendix "H" shews the number of Actions tried, or otherwise disposed of by the Justices of the High Court Division, and of the Divisional Courts of the Appellate Division, of the Supreme Court of Ontario, and the disposition thereof, during the year 1913; while Appendix "J" shews the Criminal business of the High Court Division of the Supreme Court of Ontario at its sittings throughout the Province for the same period.

Appendix "I" is a statement of the business transacted in the office of the Surrogate Clerk at Osgoode Hall, for the year 1913.

Appendix "K" shews in tabulated form the business of the Courts of General Sessions of the Peace, and of the County and District Court Judge's Criminal Courts of the Province for the same period.

No improvement has been made during the year in the vault accommodation provided by the Counties. In one instance, the Grand Jury in its presentment found as follows:—"We also recommend that steel fittings be put in the vault in the office of the Registrar of the Surrogate Court. Papers of great value are contained in this vault and at present the fittings are all of wood and not properly arranged for the convenient handling of documents." Although the attention of the County Council was directed to it by a letter to the County Clerk from this office no action has been taken in the matter.

The sums payable to the Province under R.S.O. chapter 17, sections 3 and 4, amounted to \$19,968.16 as follows:—

Local Registrars and Deputy Clerks of the Crown . . . .	\$15,948.36
Crown Attorneys and Clerks of the Peace . . . . .	4,019.80

The amount payable by the Sheriffs under section 5 of the said Statute was \$8,330.53.



Appendix "F" is a statement of the fees and emoluments of the officers for the year 1913, and of the sources from which they derive their incomes.

I have the honour to be,

Sir,

Your obedient servant,

JAS. W. MALLON,  
*Inspector.*

OSGOOD HALL, March 31st, 1914.

## APPENDIX A.—Containing in tabulated form Statistics as returned

Counties or Districts.	Number of writs of summons received for service		Number of subpoenas received for service in—				Number of orders for arrest.		Number of other process.		Total process received.	
			Criminal Cases.		Civil Cases.							
	S. C.	C. C.	S. C.	C. C.	S. C.	C. C.	S. C.	C. C.	S. C.	C. C.	S. C.	C. C.
Algoma.....	48	87	11	35	2	4	2	2	22	58	85	186
Brant.....	15	34	3	10	4	3			2	2	24	49
Bruce.....	7	17	1	21	2				12	6	22	44
Carleton.....	189	352	4	25	33	10			59	12	285	399
Dufferin.....	7	3		4	1				2		10	7
Elgin.....	12	22	1	22	3				12	3	28	47
Essex.....	33	45	10	31	11	1	1		15	11	70	88
Frontenac.....	13	49	2	1	4	3			3	3	22	57
Grey.....	13	16	5	6	3				2		23	22
Haldimand.....	3	11	41	51					1		4	11
Halton.....	9	26	1	8	4	3			8		22	37
Hastings.....	34	57	4	35	2	7			7	9	47	108
Huron.....	18	32	5	18	1	1					24	51
Kenora.....	5	7	1	6					4	2	10	15
Kent.....	36	54	1	11	2	14			17	6	56	85
Lambton.....	6	13	5	9	1	1			2	5	14	28
Lanark.....	14	19	1	2	1	1			6	6	22	28
Leeds and Grenville.....	23	31		23	1				6	2	30	56
Lennox and Addington.....	10	16		2		4			4	7	14	19
Lincoln.....	15	46	1	20	1		1		4	6	22	72
Manitoulin.....		8	8						3		11	8
Middlesex.....	35	69	5	32	13	6			14	7	67	114
Muskoka.....	6	11	6	44			1		1		14	55
Nipissing.....	14	35	9	12							23	47
Norfolk.....	7	16	2	17		1				4	9	38
Northumberland and Durham.....	15	40	5	27	4	1			3	2	27	70
Ontario.....	15	12	3	20	2				5	1	25	33
Oxford.....	21	32	32	79	8	1			9	1	70	113
Parry Sound.....	5	18	2	11	2	7			2	9	11	45
Peel.....	12	29	3	8	1	4	1	1	7	20	24	62
Perth.....	13	22	4	10				2	7	4	24	38
Peterborough.....	19	24	1	16	5	4			15	11	40	55
Prescott and Russell.....	6	22		7		1		1	1		7	31
Prince Edward.....	7	8			1				7	2	15	10
Rainy River.....	12	39	2	2	4	3	1		6	2	25	46
Renfrew.....	21	15		1	2				2	4	25	20
Simcoe.....	9	35	1	21			1		4	2	15	58
Stormont, Dundas and Glengarry.....	25	53	2	13	4			1	6	6	37	73
Sudbury.....	48	156	49	94	4	2			7	15	108	267
Temiskaming.....	12	36		14	2						14	50
Thunder Bay.....	39	90	5	35	7				38	41	89	166
Victoria.....	6	14		1					1	2	7	17
Waterloo.....	22	51	7	1	1	2			6	4	36	58
Welland.....	23	58	3	13	1		2	2	1	6	30	79
Wellington.....	15	25	3	5	4	1			6	2	28	33
Wentworth.....	108	204	2	106	19	9			29	25	158	344
York.....	34	53		451	1	12		25	4	4	41	536
Toronto.....	603	982	21		66	20		1	228	122	918	1,125
Totals.....	1,662	3,094	272	1,380	227	126	10	35	600	434	2,732	5,000

by the different Sheriffs for the year ending 31st December, 1913.

Number of persons served.		Estreats received.		Number of jurors summoned.		Number of writs of execution received.			Number of renewals of writs of execution against—		
									Goods and Lands.		
S C.	C.C.	S.C.	C.C.	S.C.	C.C.	S.C.	C.C.	D.C.	S.C.	C.C.	D.C.
126	236	.....	.....	122	86	16	58	31	5	16	.....
59	153	.....	.....	122	122	10	35	10	.....	.....	.....
21	70	.....	1	122	122	6	11	6	3	5	.....
516	616	.....	.....	219	122	73	235	40	18	9	.....
14	19	.....	.....	122	122	1	5	2	2	1	.....
41	128	.....	.....	122	122	12	16	10	.....	.....	.....
150	197	.....	.....	122	122	14	35	18	8	5	.....
34	63	.....	.....	122	98	9	32	2	4	4	.....
14	20	.....	.....	153	122	12	23	8	1	3	.....
5	15	.....	.....	122	218	3	9	1	.....	1	.....
58	94	.....	.....	122	98	10	13	8	2	2	.....
65	205	.....	.....	122	122	14	34	15	13	4	.....
53	110	.....	.....	122	122	7	23	7	1	.....	.....
15	42	.....	.....	122	122	7	16	.....	1	1	.....
68	143	.....	.....	122	122	.....	.....	.....	2	.....	.....
41	44	.....	.....	122	122	7	22	14	5	.....	.....
28	42	.....	.....	116	120	5	11	7	.....	1	.....
51	142	.....	.....	122	218	6	28	8	.....	.....	.....
23	43	.....	.....	122	98	4	13	4	.....	1	.....
18	51	.....	.....	122	98	10	13	6	1	.....	.....
11	8	.....	.....	122	98	.....	7	1	.....	1	.....
97	217	.....	1	183	122	20	46	23	1	1	2
6	44	.....	.....	122	122	2	12	4	.....	1	.....
41	82	.....	.....	129	91	37	60	30	.....	.....	.....
17	106	.....	.....	122	122	3	5	11	.....	.....	.....
65	163	.....	.....	122	122	10	12	17	5	1	.....
19	87	.....	.....	122	122	4	11	11	6	2	.....
59	47	.....	.....	122	122	12	20	9	2	.....	.....
25	89	.....	.....	126	178	6	14	5	2	8	.....
35	99	.....	.....	122	122	7	13	6	2	1	.....
73	70	.....	.....	122	122	10	17	5	3	.....	.....
69	113	.....	.....	122	122	7	16	6	1	.....	.....
15	69	.....	.....	122	122	1	23	12	.....	.....	.....
35	12	.....	.....	121	122	1	3	4	.....	1	.....
55	73	.....	.....	122	122	8	20	.....	.....	.....	.....
35	22	.....	.....	122	122	13	11	3	1	.....	1
27	100	.....	.....	106	106	9	33	19	2	2	.....
61	109	.....	.....	165	98	16	29	15	2	2	.....
92	235	.....	.....	123	86	20	85	8	.....	.....	.....
8	123	.....	.....	139	51	23	79	.....	.....	.....	.....
183	349	.....	.....	133	135	30	104	39	10	23	.....
7	17	.....	.....	98	98	7	7	2	2	5	5
55	78	.....	.....	122	118	7	24	13	3	2	.....
60	125	.....	.....	122	122	9	35	26	.....	1	.....
70	66	.....	.....	122	122	16	11	3	.....	.....	.....
214	677	.....	2	183	244	38	62	26	8	23	.....
56	2,072	.....	1	.....	332	24	48	15	13	11	.....
949	982	.....	.....	279	.....	201	607	118	89	93	.....
3,839	8,667	.....	5	6,177	5,963	767	2,046	628	218	231	8

## APPENDIX A.—Containing in tabulated form Statistics as returned by the

Counties or Districts.	Number of renewals of writs of execution against—					Number of writs of possession received		Number of writs Ca. Sa.	
	Lands only.			Goods only.					
	S.C.	C.C.	D.C.	S.C.	C.C.	S.C.	C.C.	S.C.	C.C.
Algoma .....			10						
Brant.....			1						
Bruce.....			3						
Carleton.....			2			1	3		
Dufferin.....			4						
Elgin.....						1	1		
Essex.....			6			1	4		
Frontenac.....							1		
Grey.....			1						
Haldimand.....							1		
Halton.....									
Hastings.....			5						
Huron.....			2			2		1	
Kenora.....									
Kent.....							4		
Lambton.....			4						
Lanark.....			1			1			
Leeds and Grenville.....							2		
Lennox and Addington.....									1
Lincoln.....						1			
Manitoulin.....									
Middlesex.....						2	2		
Muskoka.....									
Nipissing.....					2		2		
Norfolk.....						1			
Northumberland and Durham.....			10						
Ontario.....			2			1	1		
Oxford.....									
Parry Sound.....			4				1		
Peel.....			2			2	1		
Perth.....			1						
Peterborough.....									
Prescott and Russell ..						1			
Prince Edward.....			4				1		
Rainy River.....									
Renfrew.....									
Simcoe.....						1			
Stormont, Dundas and Glengarry.....							1		
Sudbury.....						1	1		
Thames.....						2	2		
Thunder Bay.....			4				2		
Victoria.....			2			1			
Waterloo.....						1	1		
Welland.....			1						
Wellington.....						2			
Wentworth.....			16			1	1		
York.....			3				1		
Toronto.....			21			9	12		
Totals.....			109		2	32	45	1	



different Sheriffs for the year ending 31st December, 1913. —Continued.

Number of sales under writs of execution of					Seizures under writs of execution where no subsequent sale.			Number of Attendances to seize where no goods found.		Writs of execution on which money realized.			
Goods.		Lands.											
S.C	C.C.	S.C.	C.C.	D.C	S.C.	C.C.	D.C.	S.C.	C.C.	S.C.	C.C.	D.C.	
.....	2	.....	1	1	.....	3	.....	3	3	3	12	2	
.....	5	.....	.....	.....	2	13	.....	1	1	2	12	4	
.....	1	.....	.....	1	.....	4	.....	1	.....	.....	1	1	
1	1	.....	.....	.....	8	79	.....	8	25	5	60	6	
.....	.....	.....	.....	.....	.....	1	.....	.....	1	.....	1	.....	
1	.....	.....	.....	.....	1	3	.....	1	2	2	9	1	
.....	1	.....	.....	.....	2	11	.....	1	1	3	19	7	
1	1	.....	.....	1	1	8	.....	.....	.....	.....	.....	.....	
.....	1	1	.....	.....	5	8	.....	4	9	4	7	.....	
.....	.....	.....	.....	.....	1	.....	.....	.....	.....	1	2	.....	
.....	1	.....	.....	.....	3	3	.....	.....	2	2	6	.....	
.....	2	.....	.....	.....	2	2	.....	3	2	4	25	6	
.....	1	.....	.....	1	.....	7	.....	.....	.....	.....	8	4	
.....	2	.....	.....	.....	1	3	.....	.....	.....	.....	3	.....	
1	1	.....	.....	.....	1	4	.....	.....	2	1	9	1	
1	1	1	.....	.....	3	3	.....	.....	4	6	12	7	
.....	.....	.....	.....	.....	2	5	.....	1	1	2	5	.....	
1	.....	.....	.....	1	1	12	2	1	2	2	12	3	
.....	.....	.....	.....	.....	1	3	.....	.....	1	1	2	.....	
1	.....	.....	.....	.....	.....	.....	.....	1	.....	1	4	.....	
.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	.....	
1	1	.....	1	.....	9	14	.....	4	8	9	15	.....	
.....	.....	.....	.....	.....	.....	4	.....	.....	1	.....	4	.....	
.....	.....	.....	1	.....	3	5	.....	2	6	3	6	6	
.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	2	10	
.....	.....	.....	.....	.....	.....	4	.....	6	6	1	4	.....	
.....	.....	.....	.....	.....	1	4	.....	3	7	2	1	.....	
.....	.....	.....	.....	.....	4	6	.....	.....	.....	3	6	.....	
2	1	.....	.....	.....	1	2	.....	.....	5	4	5	.....	
.....	2	.....	.....	.....	2	2	.....	3	4	6	4	2	
1	1	.....	.....	.....	2	5	.....	2	.....	3	8	3	
1	1	.....	.....	.....	.....	2	.....	.....	.....	1	3	.....	
.....	.....	.....	1	.....	.....	4	.....	.....	.....	.....	9	.....	
.....	.....	.....	.....	.....	.....	.....	.....	.....	1	2	9	.....	
.....	.....	.....	.....	.....	.....	2	.....	.....	.....	2	5	.....	
2	1	.....	1	.....	4	4	.....	2	9	1	7	.....	
.....	1	.....	.....	.....	7	8	.....	.....	.....	7	8	1	
1	.....	.....	1	.....	3	14	.....	.....	.....	3	29	.....	
.....	2	.....	1	.....	1	13	.....	.....	2	3	34	.....	
1	2	.....	.....	.....	5	28	.....	2	7	4	27	3	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	
1	.....	.....	.....	.....	1	9	.....	2	5	1	5	.....	
.....	2	.....	.....	1	2	2	.....	2	3	2	6	8	
.....	.....	.....	.....	.....	1	1	.....	.....	.....	2	2	.....	
1	4	.....	.....	1	5	12	.....	3	8	3	7	1	
.....	.....	.....	.....	.....	10	17	.....	3	7	3	12	.....	
6	7	.....	.....	1	.....	.....	.....	.....	.....	27	91	17	
24	45	2	7	8	95	334	2	59	136	131	523	92	



different Sheriffs for the year ending 31st December, 1913.—*Concluded.*

	Amounts realized under writs of execution from sales of					Amount received for fines, penalties, etc.	Amount received (not fees) under Fi. Fas. without sale, goods and lands.		
	Goods.		Lands.						
Div. C.	S. C.	C. C.	S. C.	C. C.	Div. C.		S. C.	C. C.	Div. C.
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	
163 27		300 00		33 00	20 00		3,304 82	2,048 76	146 18
57 80		772 26					7,086 42	3,058 00	360 16
36 31		832 15			325 00		203 43	59 57	
218 09	385 13	3,020 00					3,901 27	17,860 06	884 45
12 68								137 48	
113 76						50 00	340 14	1,142 07	223 96
131 54		84 69					819 10	4,926 67	619 56
15 89	500 00	259 55			335 00			2,062 00	
46 78		44 30	431 84				4,529 61	1,147 95	
2 36						3 60	600 00	388 70	
56 10		585 89					2,512 66	909 69	
61 23		531 30					828 60	4,654 54	110 80
40 32		135 00			45 25	45 00		2,084 53	292 00
		638 75						250 30	
29 70		590 79						2,209 98	
111 22		366 50	647 08	67 01	18 43		4,488 83	745 45	442 54
28 71							209 69	1,156 81	
63 94	1,430 85				265 00		143 30	2,908 92	322 18
15 83						50 00		1,484 55	
53 00	305 00							1,180 00	
9 55		200 78						387 69	
252 22	183 55	28 99					2,423 05	2,938 50	76 42
23 44								1,930 81	64 75
78 85		31 00					1,484 05	1,270 70	159 50
								360 37	1,378 32
26 16							967 18	1,073 48	
47 18						23 00	436 88	265 06	30 00
80 84							1,501 53	346 51	
34 45	185 00						334 20	1,042 31	
28 10		164 00					2,417 33	348 55	340 12
19 90	248 15	140 00				10 00	106 00	2,499 62	590 49
27 77	15 00	102 27						303 12	
67 50				358 95				1,982 07	
33 01									
	591 00	789 15					237 50	1,611 00	
12 28							1,749 73	487 13	
211 40	387 50	338 80		221 78			1,160 00		
91 11		200 00					5,309 93	1,295 29	45 54
43 80	2,500 00			40 00			1,278 33	6,837 19	
		347 00					2,423 44	7,821 52	
227 61	550 00	332 02					216 75	3,899 72	325 69
21 63								258 86	
72 78	100 00						1,280 12	467 29	
		193 50				40 00	937 07	1,105 10	936 34
17 60					35 00		693 20	986 93	
218 36	1,121 95	748 50				500 00	629 52	1,172 22	49 89
82 51						250 00	2,552 36	2,081 86	
696 43	12,099 45	1,139 78			100 00	301 00	5,121 12	15,640 15	1,478 24
3,683 01	20,602 58	12,916 97	1,078 92	720 74	1,143 68	1,272 60	62,227 16	108,829 08	8,877 13



## APPENDIX B.—Being a return of business transacted by Local Masters through

County or District.	Number of Orders made for the following purposes :					Examinations taken as special ex-aminer or otherwise before trial.
	For administration of estates.	For partition or sale of property.	Respecting Infants under R.S.O., Cap. 153, Sec. 5 (Examination only).	Under Winding-up Acts.	Other Orders made in chambers.	
Algoma .....						2
Brant .....						
Bruce .....						
Carleton .....				15	82	67
Dufferin .....					12	
Elgin .....		1				17
Essex .....						
Frontenac .....		2		1		7
Grey .....					10	
Haldimand .....						
Halton .....						
Hastings .....	4				35	14
Huron .....						
Kenora .....		1			2	3
Kent .....	1	1				
Lambton .....		1			7	5
Lanark .....						
Leeds and Grenville .....					31	
Lennox and Addington .....					1	
Lincoln .....						
Manitoulin .....						
Middlesex .....		4				
Muskoka .....						
Nipissing .....				2		
Norfolk .....						
Northumberland and Durham .....						
Ontario .....	1				1	
Oxford .....						4
Parry Sound .....						
Peel .....	1	3			27	2
Perth .....	1					1
Peterborough .....					24	
Prescott and Russell .....						
Prince Edward .....	2				6	
Rainy River .....				1		12
Renfrew .....						
Simcoe .....						
Stormont, Dundas and Glengarry .....					22	
Sudbury .....						
Temiskaming .....						
Thunder Bay .....		1	1			
Victoria .....						
Waterloo .....						
Welland .....	1					
Wellington .....				8	15	6
Wentworth .....				1	8	
Totals .....	11	14	1	28	283	140





## APPENDIX B.—Being a return of business transacted by Local Masters through

County or District.	Number of Judgments or Orders.— <i>Con</i>						
	Work and labor done.	Money received, paid, advanced, or lent.	Goods sold and delivered.	Promissory notes and bills of exchange.	Bonds, life and fire insurance.	Infants' estates.	Quieting Title matters.
Algoma .....							
Brant .....							1
Bruce .....							
Carleton .....			1				1
Dufferin .....							
Elgin .....							
Essex .....							
Frontenac .....							
Grey .....							
Haldimand .....							
Halton .....							
Hastings .....							
Huron .....							
Kenora .....							
Kent .....							
Lambton .....							
Lanark .....		1					
Leeds and Grenville .....			1				
Lennox and Addington .....							
Lincoln .....							
Manitoulin .....							
Middlesex .....							1
Muskoka .....							
Nipissing .....							
Norfolk .....							
Northumberland and Durham .....							
Ontario .....							
Oxford .....							1
Parry Sound .....							
Peel .....							
Perth .....							
Peterborough .....							
Prescott and Russell .....							
Prince Edward .....							
Rainy River .....							
Renfrew .....							
Simcoe .....							
Stormont, Dundas & Glengarry .....							
Sudbury .....							
Temiskaming .....							
Thunder Bay .....							
Victoria .....							
Waterloo .....							
Welland .....							1
Wellington .....							
Wentworth .....							
Totals .....		1	2				5

out the Province of Ontario during the year ending 31st December, 1913.

tinued.		Number of advertisements of sale issued.	Number of reports issued.	Number of references pending at date of return.	Number of bills of cost taxed by Master.	Amount realized by sales held under direction of Master.	Amount of costs of reference, etc., taxed by Master or under his direction.	Amount of commission allowed in administration and partition matters.	Amount of fees earned by Local Masters during the year.
Lunacy.	Miscellaneous.								
						\$ c.	\$ c.	\$ c.	\$ c.
	1		2	1					85 20
			1	4	4		345 35		70 80
1	11	11	20	17	18	7,300 00	1,873 44	423 00	15 00
1			2		2		145 45	162 30	2,279 11
							93 78	100 00	22 30
			2	4	1				367 24
	1	2	2	3					19 80
		2	2	2	1	12,200 00	74 05		77 50
	1	1	1	1		1,000 00		125 00	57 70
1									35 50
3		2	8	10	7	7,150 00	921 77	1,442 75	0 50
1				5					605 10
		1	2	1	1	1,800 00	50 00		15 10
2	1		2	2	1		146 36	165 00	25 00
1			2	1	1	1,000 00	55 21	125 00	66 90
			6		2		126 51		86 41
			6	6	5	4,500 00	455 66	639 93	107 54
		1		1					125 30
									18 80
	1			1					
2	3	5	9	4		5,590 00			7 30
	1		1				8 04		409 97
		2	5			11,300 00	748 62		8 00
			1	1					98 10
			2		2		26 54		
3		1	2	1	3	3,710 00			41 84
			7	3		15,000 00			72 55
									268 00
1		2	11	1	7	11,550 00	548 13	543 75	
			4	4	12	2,650 00	813 00	200 00	187 52
		1	4	5		40,300 00		186 00	122 60
			1		1		177 60		185 20
		2	3		7	3,600 00	516 33	331 25	21 10
			1						157 37
									176 90
			2		2		118 68		
	1		6	7	4		265 88		34 28
		1	3	5	3	1,500 00	59 87		313 60
			2		3		20 10		23 20
		1	4	4		1,405 50		984 75	20 10
1			2		3				44 70
	10	1	3	2		2,575 00			20 30
			5	3					124 20
		2	10	13	14		205 70	1,117 75	81 50
1	3	1	6	2	1				336 24
									185 60
18	36	39	152	116	105	134,130 50	7,796 07	6,546 48	7,020 97

APPENDIX C.—A return of all business transacted by Local Registrars,  
31st Dec.

County or District.	Writs of summons issued.	Orders for arrest issued.	Actions entered in Procedure Book.			Precipe orders issued.	Orders issued and signed by Local Judge.	Examination of parties returned.	Records passed.	Actions entered for Trial.		Actions tried.		Workmen's Compensation Actions tried.	
			Writs issued during year.	Writs issued during previous years.	Otherwise than by Writ.					With Jury.	Without Jury.	With Jury.	Without Jury.	With Jury.	Without Jury.
Algoma.....	64	...	53	2	13	19	75	25	12	16	3	13	4	...	4
Brant.....	52	...	44	1	3	8	9	17	17	10	12	4	10	2	...
Bruce.....	26	...	24	1	1	2	8	9	6	1	7	1	7	...	...
Carleton.....	281	...	218	11	33	60	37	25	55	12	76	13	62	...	...
Dufferin.....	4	...	4	...	5	2	...	2	2	3	1	1	1	...	...
Elgin.....	46	...	41	2	9	15	13	15	22	9	13	2	11	...	1
Essex.....	103	...	87	4	10	45	62	55	46	12	35	6	24	3	...
Frontenac.....	48	...	32	1	8	16	15	9	7	2	5	...	5	...	...
Grey.....	41	...	32	1	4	8	3	10	13	3	7	2	8	...	2
Haldimand.....	1	...	...	...	...	...	2	...	5	1	4	...	3	...	...
Halton.....	13	...	12	...	...	...	...	...	2	1	4	0	3	...	...
Hastings.....	66	...	50	2	3	15	5	18	19	9	14	3	11	1	...
Huron.....	46	...	37	...	2	14	12	16	19	5	13	3	8	1	...
Kenora.....	13	...	11	...	3	3	6	1	1	...	1	...	1	...	...
Kent.....	51	...	40	3	1	16	27	12	12	2	10	2	10	...	...
Lambton.....	43	...	38	2	6	21	13	29	15	6	9	3	11	...	...
Lenark.....	28	...	22	1	...	5	9	4	2	2	2	1	2	1	1
Leeds and Grenville...	46	...	34	3	...	8	...	14	10	2	8	2	8	1	1
Lennox and Addington.	22	...	16	...	1	5	5	7	10	6	6	2	6	...	...
Lincoln.....	41	1	35	...	5	9	10	21	17	7	9	4	8	2	2
Manitoulin.....	4	...	2	...	...	2	3	...	...	...	...	...	...	...	...
Middlesex.....	145	...	101	3	33	31	36	48	36	20	26	16	17	5	3
Muskoka.....	13	...	12	2	...	7	3	5	4	6	...	3	...	...	...
Nipissing.....	94	...	75	9	14	14	67	12	38	12	17	3	5	1	...
Norfolk.....	15	...	13	...	1	2	1	3	...	1	1	1	...	...	...
Northumberland and Durham.....	33	...	31	1	...	9	16	7	5	2	3	3	2	...	...
Ontario.....	33	...	30	3	1	10	3	8	13	3	9	2	4	...	...
Oxford.....	39	...	56	2	1	12	11	8	6	2	8	2	7	...	...
Parry Sound.....	8	...	4	3	2	5	1	1	2	2	...	2	...	...	...
Peel.....	25	...	23	...	1	10	5	5	7	4	6	2	2	...	...
Perth.....	40	...	32	1	6	6	11	27	17	7	11	7	7	...	...
Peterborough.....	47	...	39	1	8	7	2	26	12	5	10	2	8	1	...
Prescott and Russell..	15	...	13	...	...	10	4	3	7	2	5	1	5	...	...
Prince Edward.....	6	...	3	2	...	...	...	...	...	...	...	...	...	...	...
Rainy River.....	15	1	11	1	6	6	7	7	5	...	8	...	8	...	...
Renfrew.....	31	...	27	1	...	...	4	11	5	1	4	1	3	...	...
Simcoe.....	76	...	65	...	...	10	17	6	24	9	15	2	8	...	...
Stormont, Dundas and Glengarry.....	65	...	45	3	13	12	4	4	14	7	9	2	11	1	...
Sudbury.....	68	...	50	44	6	4	25	...	23	17	17	7	8	...	...
Temiskaming.....	69	...	34	...	10	1	11	11	7	19	8	9	5	6	...
Thunder Bay.....	176	...	156	4	17	22	62	37	56	17	37	8	16	...	...
Victoria.....	15	...	13	2	1	1	4	8	3	1	2	...	1	...	...
Waterloo.....	60	...	50	4	31	20	30	35	19	4	17	...	11	...	...
Welland.....	55	2	51	1	3	17	7	12	13	5	15	2	18	1	...
Wellington.....	42	...	37	3	3	14	1	...	6	1	9	...	6	...	...
Wentworth.....	245	...	223	8	34	72	72	12	91	62	43	16	50	8	3
Totals.....	2469	4	2026	132	298	575	718	585	705	318	519	153	405	34	17



Deputy Registrars and Deputy Clerks of the Crown for the year ending  
ember, 1913.

Rem- anets standing for trial.		Judgments entered without trial.	Amount of such judgments, without costs.		Amount of costs taxed there- under (exclusive of Dis- bursements).		Amount of disbursements al- lowed.		Judgments entered after trial.		Amount of such judgments, without costs.		Amount of costs taxed there- under (exclusive of Dis- bursements).		Amount of disbursements allowed.		Number of Judgments for over \$10,000.	Number of Judgments for \$10,000 and above \$5,000.
With Jury.	Without Jury.																	
			\$	c.	\$	c.	\$	c.			\$	c.	\$	c.	\$	c.		
.....		17	40,504	29	389	82	175	41	9		7,167	52	562	50	135	65	....	2
.....		10	22,736	55	237	30	48	79	9		15,449	04	716	00	150	96	....	4
.....		5	3,846	75	201	10	121	81	1		600	00	.....	.....	.....	.....	.....	.....
.....	12	73	143,712	04	2,770	14	512	68	62		124,712	79	5,555	74	1,028	58	4	9
.....		4	1,818	22	49	80	23	68	2		200	00	208	53	34	73	.....	.....
.....	2	4	.....	.....	104	75	12	21	12		13,095	83	804	50	64	77	.....	.....
.....	1	4	15	21,896	51	614	74	116	04	33	26,597	20	2,481	95	1,182	25	1	1
.....		6	10,661	54	189	61	41	40	.....		.....	.....	.....	.....	.....	.....	.....	.....
.....		8	5,722	49	368	70	41	08	8		16,568	07	815	62	334	65	.....	1
.....		2	1,931	22	59	20	9	20	2		.....	.....	130	53	29	25	.....	.....
.....		3	3,101	98	58	86	28	73	4		7,739	19	271	30	66	59	.....	.....
.....	1	12	11,430	72	109	55	59	62	12		8,880	50	1,578	44	480	80	.....	1
.....	1	6	7	18,164	39	173	58	69	22	9	4,746	66	340	87	277	95	.....	1
.....		2	15,352	37	53	75	17	95	1		.....	.....	75	30	97	08	1	.....
.....		6	5,543	80	149	50	77	06	5		3,150	00	560	00	446	00	.....	.....
.....	1	3	5,325	31	89	70	12	38	6		2,547	00	1,006	10	133	42	.....	.....
.....		7	5,518	64	210	38	77	58	6		1,325	00	154	99	75	82	.....	.....
.....		11	20,146	93	684	63	212	60	.....		.....	.....	.....	.....	.....	.....	.....	1
.....	1	4	9,486	47	138	78	46	14	4		800	00	431	40	85	50	.....	1
.....		1	1,232	52	30	50	5	50	2		5,058	31	414	00	20	60	.....	.....
.....	4	6	21	19,340	39	502	05	55	41	13	10,999	37	703	57	172	43	.....	.....
.....		3	3,450	70	43	00	18	52	1		3,000	00	.....	.....	.....	.....	.....	.....
.....		24	22,101	95	458	53	171	16	17		14,670	57	232	10	58	21	.....	.....
.....			.....	.....	.....	.....	.....	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....
.....		12	14,690	18	980	25	71	06	3		530	95	.....	.....	.....	.....	.....	.....
.....	1	4	4,748	00	90	35	30	16	4		1,650	00	216	50	134	61	.....	.....
.....	1	5	5,207	66	138	10	65	89	2		5,594	52	.....	.....	4	70	.....	.....
.....			.....	.....	.....	.....	.....	.....	3		1,553	00	57	46	.....	.....	.....	.....
.....	1	5	3	2,254	25	68	02	10	42	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	2	9	5,266	96	195	70	45	39	11		4,200	00	794	80	118	70	.....	.....
.....	1	8	5,278	10	234	80	67	56	5		850	00	84	60	19	40	.....	.....
.....		3	3,740	00	27	00	5	80	1		.....	.....	.....	.....	.....	.....	.....	.....
.....		2	3,002	68	34	00	12	44	1		2,546	67	159	65	221	12	.....	.....
.....		2	9,566	00	.....	.....	.....	.....	1		3,724	81	.....	.....	.....	.....	.....	.....
.....	1	7	190,019	69	138	10	45	82	1		.....	.....	.....	.....	.....	.....	1	1
.....		18	42,549	38	788	80	83	82	9		9,668	26	208	10	40	00	.....	.....
.....		18	25,934	98	393	90	188	86	13		31,360	70	1,446	20	414	39	1	2
.....	1	12	9,234	30	197	08	72	46	11		22,965	32	338	49	38	34	.....	2
.....	2	5	3,253	01	98	44	23	37	2		.....	.....	.....	.....	.....	.....	.....	.....
.....	4	5	20	35,768	16	500	42	153	56	25	24,078	64	911	30	22	85	.....	2
.....	1	2	4,171	61	104	40	43	22	.....		.....	.....	.....	.....	.....	.....	.....	.....
.....	2	9	10,249	35	260	20	76	93	10		13,387	46	801	41	452	07	.....	1
.....		5	6,504	58	31	51	29	40	7		6,500	62	169	41	181	00	.....	.....
.....		13	17,045	86	199	96	.....	.....	4		.....	.....	.....	.....	.....	.....	1	1
.....	6	5	47	78,883	89	1,144	26	253	67	31	51,574	68	2,803	81	236	88	1	4
23	54	452	870,394	42	13,313	26	3,235	00	362		447,492	68	25,035	17	6,759	30	10	34

APPENDIX C.—A return of all business transacted by Local Registrars.  
31st Dec

County or District.	Number of Judgments for \$5,000 and above \$2,000.	Number of Judgments for \$2,000 and above \$1,000.	Number of Judgments for \$1,000 and above \$400.	Number of Judgments for \$400 and under.	Number of Judgments dismissing actions.	Number of Judgments in default of appearance or pleading.	Number of Judgments under Con. Rule 57.	Number of Judgments for reference to Master.	Number of Writs of Execution issued.	Number of Writs of Execution renewed.	No. of Writs of <i>Ca. Sa.</i> issued.	Number of Certificates issued under Creditors' Relief Act.	Amount for which issued, without costs.
													\$ c.
Algoma.....	4	8	8	4	...	14	3	2	12	2	...	...	...
Brant.....	3	3	2	...	2	7	1	2	6	5	...	...	...
Bruce.....	1	...	3	...	1	4	...	...	5	1	...	...	...
Carleton.....	22	30	7	10	22	33	12	24	50	20	...	...	...
Dufferin.....	...	...	3	1	3	...	...	1	2	5	...	...	...
Elgin.....	3	3	2	2	1	...	...	3	7	2	...	...	...
Essex.....	4	8	7	2	14	10	1	2	13	5	...	...	...
Frontenac.....	2	2	1	...	...	...	...	1	4	2	...	...	...
Grey.....	3	5	3	...	1	5	1	1	9	2	...	...	...
Haldimand.....	...	2	2	...	...	2	...	...	2	...	...	...	...
Halton.....	2	2	3	...	3	3	...	...	3	1	...	...	...
Hastings.....	3	4	4	...	1	5	...	5	11	7	...	...	...
Huron.....	3	5	...	7	2	7	...	2	2	3	1	...	...
Kenora.....	...	1	...	...	1	1	1	...	1	1	...	...	...
Kent.....	...	4	4	3	1	6	...	1	4	2	...	...	...
Lambton.....	1	3	...	3	2	3	...	...	6	2	...	...	...
Lanark.....	...	3	4	6	...	2	1	3	4	...	...	...	...
Leeds and Grenville.....	2	5	2	1	4	8	...	3	4	...	...	...	...
Lennox and Addington.....	...	1	1	5	1	3	...	1	4	2	...	...	...
Lincoln.....	2	1	3	15	...	1	...	...	3	2	...	...	...
Manitoulin.....	...	...	...	...	...	...	...	...	...	...	...	...	...
Middlesex.....	7	7	1	...	5	13	4	1	9	1	...	...	...
Muskoka.....	2	1	...	...	...	2	...	...	2	1	...	...	...
Nipissing.....	5	14	8	...	1	14	7	3	28	4	...	...	...
Norfolk.....	...	...	...	...	...	...	...	...	...	...	...	...	...
Northumberland and Durham.....	3	4	...	1	2	5	...	...	4	1	...	...	...
Ontario.....	...	3	2	1	...	4	...	...	3	2	...	...	...
Oxford.....	2	2	3	...	...	5	...	...	6	...	...	...	...
Parry Sound.....	...	1	1	1	...	...	...	...	1	1	...	...	...
Peel.....	...	1	1	...	...	3	...	...	1	...	...	...	...
Perth.....	3	1	1	8	7	8	2	...	9	2	...	...	...
Peterborough.....	...	2	3	1	...	8	...	3	2	1	...	...	...
Prescott and Russell.....	1	...	...	...	1	1	...	2	2	1	...	...	...
Prince Edward.....	1	2	...	...	...	2	...	2	1	...	...	...	...
Rainy River.....	2	...	...	1	...	...	...	1	3	...	...	...	...
Renfrew.....	1	2	1	...	1	1	...	...	...	...	...	...	...
Simcoe.....	10	8	2	2	5	9	...	1	8	4	...	...	...
Stormont, Dundas and Glengarry.....	4	6	4	4	2	17	...	8	7	...	...	...	...
Sudbury.....	2	6	4	2	...	...	...	...	11	...	...	...	...
Temiskaming.....	...	2	1	...	2	3	...	1	1	...	...	...	...
Thunder Bay.....	4	12	15	...	2	20	2	3	30	4	...	...	...
Victoria.....	1	1	...	...	...	...	...	...	...	1	...	...	...
Waterloo.....	2	8	1	...	1	6	5	1	2	...	...	...	...
Welland.....	3	2	1	6	2	5	...	1	4	...	...	...	...
Wellington.....	2	1	1	1	7	...	6	5	2	...	...	...	...
Wentworth.....	15	17	17	24	4	20	...	4	37	11	...	...	...
Totals.....	125	191	125	113	96	263	46	87	325	98	1	...	...

Deputy Registrars and Deputy Clerks of the Crown for the year ending  
ember, 1913.—Continued.

Amount of Costs allowed there- under (including Disburse- ments).	Number of days of sitting of Judge with Jury.	Number of days of sitting of Judge without Jury.	Number of Estreats ordered to be issued.	Number of Estreats issued.	Amount of Jury fees paid County or Provincial Treasurer.	Amount of money paid into Court with defence.	Amount of money paid out of Court.	Fees collected in law stamps by Deputy Clerks and Local Registrars.
\$ c.					\$ c.	\$ c.	\$ c.	\$ c.
8	8				9 00	1,137 86		442 00
3	6				30 00	320 41		290 80
2	7				3 00		111 77	157 10
7	25				36 00	993 26		624 90
1	2				9 00			52 00
3	6				27 00			314 80
6	13				36 00	2,641 25		828 85
4	3				6 00			118 70
12	3				9 00	1,308 59		225 30
4					3 00			59 40
1	2				3 00			77 80
5	7				27 00	750 00		70 50
6	3				15 00	1,113 73		244 60
2	1		1	1				61 10
2	10				6 00	230 94		263 70
7	4				18 00			253 10
4	2				6 00			165 15
4	4				6 00			256 20
4	4				18 00			161 70
6	2				21 00			240 40
								17 10
5	12				58 50			219 40
4	4				18 00			77 40
6	3				36 00	10 00		580 40
5	3							60 20
9	2				4 50			185 45
4	3				6 00	371 00		187 80
7					6 00			159 10
2					6 00			33 00
6	4				6 00			139 40
6	3				21 00	28 50		311 90
5	8				15 00			339 10
1	3				6 00	5 00		92 50
	2							28 10
5	4							97 55
1	10				3 00	4,177 75		123 20
3	11				27 00			340 80
9	4				9 00			351 50
11	4				54 00			79 00
11	4				57 00			270 90
5	13		1	1	48 00	4,395 00		1,024 40
1	3				3 00			67 00
3	3				12 00	6,081 00		469 00
4	4				15 00			252 50
3	10				3 00			242 90
42	7				186 00	1,564 60		1,548 80
249	228		2	2	888 00	25,128 89	111 77	12,206 45



## APPENDIX D.—Being a return of business transacted by County and District

County or District.	Writs of summons issued.		Orders for arrest issued.		Actions entered in Procedure Book.		Præcipe orders issued.	Orders issued and signed by Local Judge.		Examination of Parties returned.	Records passed.	Actions entered for Trial with Jury.		Actions entered for Trial without Jury.		Number of actions tried with Jury.		Number of actions tried without Jury.		Workmen's Compensation Actions for Trial.	
			Writs issued during the year.	Do. previous year.	Otherwise than by Writ.															With Jury	Without Jury
Algoma .....	94	1	79	4	2	31	81	14	16	1	25	1	10	...	...	...	...	...	...	...	...
Brant .....	100	..	67	2	14	18	13	19	31	7	25	7	12	...	...	...	...	...	...	...	...
Bruce .....	61	..	44	1	8	9	37	17	15	10	6	8	5	...	...	...	...	...	...	...	...
Carleton .....	540	..	377	24	12	12	128	43	58	6	52	6	51	...	...	...	...	...	...	...	...
Dufferin .....	14	..	14	...	3	...	10	5	6	3	3	1	2	...	...	...	...	...	...	...	...
Elgin .....	55	..	34	3	...	6	10	6	10	7	3	4	1	...	...	...	...	...	...	...	...
Essex .....	85	..	74	6	15	22	...	50	33	12	21	12	12	...	...	...	...	...	...	...	...
Frontenac .....	73	..	52	...	6	14	21	11	4	1	3	1	3	...	...	...	...	...	...	...	...
Grey .....	64	..	51	2	...	15	4	22	18	7	10	5	9	...	...	...	...	...	...	...	...
Haldimand .....	40	..	30	7	3	1	...	4	6	2	4	2	4	...	...	...	...	...	...	...	...
Halton .....	31	..	20	...	...	3	9	...	5	1	4	...	5	...	...	...	...	...	...	...	...
Hastings .....	97	..	84	4	5	35	37	21	43	23	23	5	18	...	...	...	...	...	...	...	...
Huron .....	60	..	39	5	2	10	11	9	24	9	15	5	12	...	...	...	...	...	...	...	...
Kenora .....	34	..	24	...	1	4	23	2	4	...	6	...	6	...	...	...	...	...	...	...	...
Kent .....	90	..	61	2	...	10	29	18	16	5	11	5	9	...	...	...	...	...	...	...	...
Lambton .....	54	..	37	1	15	27	14	19	16	7	9	1	13	...	...	...	...	...	...	...	...
Lanark .....	24	..	16	3	...	3	6	4	1	...	2	...	2	...	...	...	...	...	...	...	...
Leeds & Grenville .....	62	..	47	2	...	19	1	11	10	2	8	2	8	...	...	...	...	...	...	...	...
Lennox & Addington ..	20	..	15	1	...	5	9	3	5	1	4	1	3	...	...	...	...	...	...	...	...
Lincoln .....	62	..	47	2	...	5	10	5	...	1	13	1	11	...	...	...	...	...	...	...	...
Manitoulin .....	15	..	12	...	...	4	10	...	3	...	3	...	2	...	...	...	...	...	...	...	...
Middlesex .....	245	..	171	4	29	43	66	48	35	13	20	12	18	...	...	...	...	...	...	...	...
Muskoka .....	23	..	19	...	...	2	4	3	8	3	6	1	6	...	...	...	...	...	...	...	...
Nipissing .....	162	..	129	15	8	17	122	12	33	7	23	2	21	...	...	...	...	...	...	...	...
Norfolk .....	34	..	18	...	2	...	9	5	3	3	...	2	...	...	...	...	...	...	...	...	...
Northumb'rl'd & Durham	57	..	34	...	2	16	30	13	11	4	7	2	11	...	...	...	...	...	...	...	...
Ontario .....	35	..	29	...	4	1	12	3	7	4	3	5	...	...	...	...	...	...	...	...	...
Oxford .....	52	..	38	2	2	7	27	10	11	6	3	4	2	...	...	...	...	...	...	...	...
Parry Sound .....	20	..	17	...	2	17	1	3	9	...	9	...	9	...	...	...	...	...	...	...	...
Peel .....	24	..	39	...	4	22	10	13	14	3	10	3	10	...	...	...	...	...	...	...	...
Perth .....	79	..	57	1	2	12	34	38	29	13	15	15	12	...	...	...	...	...	...	...	...
Peterborough .....	52	..	47	1	5	12	...	16	10	2	8	2	5	...	...	...	...	...	...	...	...
Prescott and Russell ..	25	..	16	1	...	3	11	10	4	1	3	1	2	...	...	...	...	...	...	...	...
Prince Edward .....	13	..	10	...	3	1	5	1	6	4	2	3	3	...	...	...	...	...	...	...	...
Rainy River .....	47	..	36	1	4	18	7	1	7	2	8	2	7	...	...	...	...	...	...	...	...
Renfrew .....	23	..	15	4	...	...	18	2	4	...	4	...	4	...	...	...	...	...	...	...	...
Simcoe .....	113	..	85	...	...	24	27	5	19	6	13	2	11	...	...	...	...	...	...	...	...
Stormont, Dundas and Glengarry .....	90	..	66	7	2	39	9	2	15	5	10	3	11	...	...	...	...	...	...	...	...
Sudbury .....	194	..	160	132	...	11	57	...	47	4	43	4	21	...	...	...	...	...	...	...	...
Temiskaming .....	94	..	52	...	1	...	17	8	10	5	6	4	3	...	...	...	...	...	...	...	...
Thunder Bay .....	189	..	165	3	...	14	35	9	20	4	15	3	10	...	...	...	...	...	...	...	...
Victoria .....	38	..	24	1	2	10	8	10	10	...	10	...	5	...	...	...	...	...	...	...	...
Waterloo .....	118	..	85	4	...	31	29	36	25	4	21	2	14	...	...	...	...	...	...	...	...
Welland .....	76	2	57	1	1	5	8	3	18	2	17	1	16	...	...	...	...	...	...	...	...
Wellington .....	48	..	40	...	...	7	13	...	11	2	10	2	3	...	...	...	...	...	...	...	...
Wentworth .....	444	..	321	16	15	61	75	43	140	97	43	30	54	...	...	...	...	...	...	...	...
York .....	2,531	2	1,744	106	6	380	795	270	550	136	414	93	227	...	...	...	...	...	...	...	...
Totals .....	6,501	5	4,668	265	180	1006	1,892	847	1380	435	973	265	683	29	19	...	...	...	...	...	...



Court Clerks throughout the Province of Ontario for the year ending 31st December, 1913.

With Jury	Number of Remanets standing for Trial.	Number of Judgments entered without Trial.	Total amount of such Judgments without costs.	Total amount of Costs taxed there- under (exclusive of Disburse- ments).	Total amount of Disbursements allowed.	Number of Judgments entered after Trial.	Total amount of such Judgments without costs.	Total amount of Costs taxed there- under (exclusive of Disburse- ments).	Total amount of Disbursements allowed.	Number of Judgments \$400 and under.	Number of Judgments dismissing actions.	Number of Judgments in default of appearance or pleading.	Number of Judgments under Con. Rule 57.
Without Jury	Without Jury	Without Trial.	without costs.	under (exclusive of Disbursements).	allowed.	Trial.	without costs.	under (exclusive of Disbursements).	allowed.	Number of Judgments \$400 and under.	Number of Judgments dismissing actions.	Number of Judgments in default of appearance or pleading.	Number of Judgments under Con. Rule 57.
5	5	47	\$ 12,923 68	\$ 893 30	\$ 408 11	8	\$ 2,213 66	\$ 501 10	\$ 241 74	55	1	36	10
4	4	25	6,141 22	367 35	158 38	11	1,854 29	438 42	238 53	31	2	22	2
2	16	5,483 54	265 58	92 64	5	302 13	216 95	217 38	18	3	16	....	....
1	3	259	78,856 40	3,594 48	1,477 52	24	4,112 49	763 82	176 60	268	7	199	43
1	4	4	1,410 56	59 65	21 96	2	50 00	.....	.....	5	1	4	....
2	14	4	4,529 76	167 68	61 78	3	302 50	117 80	65 53	17	....	14	....
7	28	10,924 34	495 02	156 67	22	3,512 70	1,977 22	950 43	41	6	25	3	
2	25	8,297 83	251 97	114 16	4	1,458 66	163 45	156 48	33	....	4	1	
2	19	7,498 23	213 93	92 35	6	2,403 55	358 76	110 32	24	1	18	1	
17	5,084 74	325 73	96 13	1	.....	.....	.....	.....	17	1	16	....	....
8	2,024 54	98 10	50 70	3	954 66	87 60	93 85	11	....	8	....	....	....
1	8	29	6,434 36	1,427 60	574 62	10	2,605 07	999 40	345 13	37	1	27	2
2	5	13	6,347 52	154 26	93 83	2	2,248 15	394 76	334 12	21	3	13	....
2	9	2,565 09	177 60	74 90	3	298 58	118 00	21 80	10	1	9	....	....
2	24	7,100 71	308 88	164 20	3	788 40	324 80	238 00	27	1	17	7	
10	3,961 03	123 35	43 07	8	1,336 53	316 30	388 58	16	2	10	....	....	....
11	2,379 72	144 40	65 17	1	303 16	78 25	117 05	1	....	11	....	....	....
26	7,247 64	565 58	211 50	4	860 40	572 50	335 90	30	....	23	3		
9	2,729 86	191 13	58 13	5	890 00	534 57	223 63	14	2	9	....	....	....
16	4,847 73	278 04	84 26	2	160 00	190 03	76 93	16	....	14	2		
1	223 10	153 93	16 63	.....	.....	.....	.....	1	....	....	....	....	....
1	68	29,193 16	1,247 39	403 87	15	3,187 28	884 48	448 51	72	11	56	12	
5	1,900 02	94 79	33 65	3	405 85	123 85	31 43	9	....	6	1		
71	23,825 06	1,068 60	351 08	32	6,838 58	894 65	775 65	97	3	60	11		
2	285 77	65 18	14 87	.....	.....	.....	.....	2	....	2	....	....	....
2	12	2,029 46	169 52	64 27	3	723 93	7 00	.....	14	1	10	....	....
2	8	2,538 81	184 34	42 46	6	907 00	405 13	316 47	12	1	8	....	....
21	6,502 39	372 57	173 98	1	576 50	79 50	72 86	22	....	21	....	....	....
1	321 00	21 28	4 28	3	1,008 50	108 53	38 08	6	....	2	....	....	....
7	1,957 80	136 50	53 40	6	1,545 00	287 30	144 00	6	2	7	....	....	....
1	3	26	9,849 08	269 70	139 49	9	1,219 87	602 29	408 70	33	2	24	2
22	7,439 41	348 36	133 53	3	427 85	114 84	159 13	24	1	18	3		
5	1,027 09	63 63	33 55	.....	.....	.....	.....	5	....	....	....	....	....
6	1,545 15	154 55	46 90	4	530 00	200 62	194 07	10	....	6	....	....	....
7	1,224 62	151 36	50 86	6	1,511 86	250 30	40 30	20	....	12	....	....	....
1	42	13,789 11	973 04	582 40	10	1,318 00	286 03	273 40	52	5	41	....	....
1	3	38	10,707 42	566 25	273 28	8	2,140 65	726 55	283 90	43	2	32	6
22	69	21,779 55	779 92	474 90	29	6,688 88	614 60	473 73	98	....	....	....	....
1	25	7,952 72	907 95	139 61	3	1,635 04	435 40	110 90	28	....	25	3	
79	27,779 46	1,180 26	503 21	12	4,377 04	410 86	44 69	91	2	79	2		
2	10	2,801 40	161 25	68 67	3	515 97	178 30	247 42	10	1	2	....	....
9	37	10,308 43	490 93	217 69	10	898 00	563 60	370 62	39	3	26	1	
2	16	5,802 34	183 32	161 20	7	146 25	.....	.....	17	4	16	....	....
5	17	2,846 57	207 79	45 59	3	1,049 74	316 54	104 39	14	1	8	2	
6	1	85	26,251 08	1,686 06	528 56	35	5,238 68	1,428 65	769 23	120	10	70	....
24	28	837	254,967 96	11,650 20	4,357 78	259	46,913 81	12,428 17	3,558 78	1096	104	711	126
47	118	2126	661,636 46	33,392 30	13,015 79	597	116,460 21	19,500 92	13,198 26	2633	185	1737	243

## APPENDIX D.—Being a return of business transacted by County and District

County or District.	Number of Judgments for reference to Master.	Writs of Execution issued.	Number of Writs of Execution renewed.	Number of Writs of <i>Ca. Sa.</i> issued.	Number of Certificates issued under Creditors' Relief Act.	Amount for which issued without Costs.	Amount of Costs allowed thereunder (including Disbursements).	Number of days of sittings of County Court.	Amount of Jury Fees paid County or Provincial Treasurers.	Amount of money paid into Court with defence.
						\$ c.	\$ c.		\$ c.	\$ c.
Algoma.....	39	12	....	2	433 67	....	3 7	1 50	453 65	
Brant.....	27	2	....	....	....	....	5 9	10 50	66 00	
Bruce.....	12	1	....	....	....	....	6 6	15 00	468 76	
Carleton.....	213	13	....	17	3,261 95	106 51	14 45	9 00	685 00	
Dufferin.....	3	....	....	....	....	....	1 6	1 50	....	
Elgin.....	12	1	....	....	....	....	6 2	10 50	....	
Essex.....	28	3	....	....	....	....	9 10	18 00	192 05	
Frontenac.....	28	2	....	....	....	....	4 2	1 50	....	
Grey.....	17	1	....	....	....	....	5 8	10 50	410 90	
Haldimand.....	10	....	....	....	....	....	7 9	3 00	140 71	
Halton.....	8	....	....	....	....	....	7	1 50	....	
Hastings.....	1 28	3	1	....	....	....	9 27	31 50	250 00	
Huron.....	12	3	....	....	....	....	8 4	13 50	98 55	
Kenora.....	1 9	1	....	2	6 00	10 80	5	....	....	
Kent.....	18	1	....	....	....	....	4 13	7 50	65 59	
Lambton.....	10	....	....	....	....	....	6 7	11 50	69 78	
Lanark.....	1 6	1	....	....	....	....	9	....	154 15	
Leeds and Grenville.....	1 21	....	....	....	....	....	7 11	1 50	106 70	
Lennox and Addington.....	12	3	....	....	....	....	2 3	1 50	....	
Lincoln.....	11	....	....	....	....	....	8 7	1 50	293 00	
Manitoulin.....	....	....	....	....	....	....	6	....	371 00	
Middlesex.....	62	2	....	7	10,922 77	54 95	9 19	22 50	657 50	
Muskoka.....	7	1	....	....	....	....	5 5	4 50	115 85	
Nipissing.....	80	....	....	1	260 98	9 60	6 5	16 50	207 00	
Norfolk.....	2	....	....	....	....	....	6 2	....	....	
Northumberland and Durham.....	10	2	....	....	....	....	7 20	6 00	1,221 37	
Ontario.....	7	....	....	....	....	....	6	7 50	11,050 00	
Oxford.....	13	2	....	....	....	....	7 1	9 00	940 00	
Parry Sound.....	....	....	....	....	....	....	7	....	315 96	
Peel.....	4	....	....	....	....	....	2 18	4 50	47 00	
Perth.....	22	....	....	....	....	....	9 13	22 50	740 89	
Peterborough.....	18	2	....	....	....	....	3 11	3 00	146 66	
Prescott and Russell.....	4	....	....	....	....	....	3 6	2 00	72 25	
Prince Edward.....	1 1	1	....	....	....	....	3 3	6 00	....	
Rainy River.....	15	....	....	....	....	....	4 5	4 50	898 79	
Renfrew.....	1 3	2	....	....	....	....	10	....	12,764 20	
Simcoe.....	1 36	....	....	....	....	....	4 13	9 00	387 54	
Stormont, Dundas and Glengarry.....	1 27	2	....	....	....	....	11 10	7 50	398 00	
Sudbury.....	39	....	....	....	....	....	8 7	6 00	1,243 98	
Temiskaming.....	21	....	....	....	....	....	3 5	7 50	463 75	
Thunder Bay.....	92	20	....	....	....	....	3 6	6 00	1,439 01	
Victoria.....	5	....	....	....	....	....	13	....	294 19	
Waterloo.....	1 27	....	....	....	....	....	3 12	6 00	1,477 17	
Welland.....	2 7	1	....	....	....	....	2 7	1 50	242 58	
Wellington.....	5	....	....	....	....	....	2 6	3 00	26 25	
Wentworth.....	59	20	....	1	1,562 00	28 45	17 23	145 50	1,453 88	
York.....	6 860	120	....	....	....	....	81 147	186 00	3,236 85	
Totals.....	16 1950	222	1	30	16,447 37	210 31	315 570	637 50	43,666 51	

Court Clerks in the Province of Ontario for the year ending 31st December, 1913.—Concluded.

Amount of money paid out of Court.	Number of Partition Matters.	Amount of money paid thereunder.	Amounts paid out.	Amount of moneys in Court in County Court matters, including interest (under Con. Rule 769).	Number of Chattel Mortgages and Bills of Sale filed.	Total amount secured by such mortgages.	Number of mortgages renewed.	Number of discharges filed.	Number of assignments for benefit of creditors.	Number of Hire Receipts, etc., filed under R.S.O. Cap. 136.	Total amount secured by such Receipts, etc.	Amount of fees collected in law stamps under Section 42 of the Creditors' Relief Act.
\$ c.			\$ c.	\$ c.		\$ c.					\$ c.	\$ c.
384 48				159	8,387,143 90	63	12	8	115	134,194 29		
				143	1,127,922 24	67	10	6	247	50,931 34		
67 03				185	99,568 00	105	4	4	133	29,712 75		
				11,773 85	108,790 58	110	13	48	820	286,323 34	7 20	
				160 27	22,978 18	40	1	2	58	5,979 07		
				445 80	316,054 84	108	6	9	131	33,401 25		
386 25				254	104,944 62	85	12	2	295	135,438 53		
				429 20	245,117 16	102	7	4	287	28,562 00		
				253	259,438 98	190	6	9	257	41,146 09		
410 90				471	30,813 19	30	6	3	41	21,126 27		
41 51				73	24,844 66	28	4	2	34	134,326 67		
97 11				30	179,319 32	183	13	19	220	59,833 05		
6,314 98				4,987 67	103,167 58	96	6	6	69	14,356 46		
		21 54		91	3,061,565 00	16	6	1	60	24,975 82		
				100 00	147,983 05	193	13	8	466	57,799 85		
200 00				172 50	76,115 19	182	4	5	80	22,804 69		
107 88				11 90	71,019 92	47	4	6	33	11,141 80		
				1,220 60	76,483 89	114	3	6	120	20,749 05		
				3,610 04	109,147 23	89	9	2	137	10,678 50		
253 45				86	207,507 90	41	4	5	189	116,980 07		
156 00				78	28,360 88	52	3					
371 00				113	1,865,243 28	125	7	14	498	114,165 16	5 30	
307 50				144	82,774 20	37	8	3	51	16,327 24		
				315 85	3,175,788 71	87	13	13	90	38,996 68	1 60	
21,393 04				4,791 54	44,825 19	98	6	6	108	19,691 70		
				380 04								
6,841 87				23,623 31	114,772 86	165	12	5	109	27,043 04		
6,741 40				20,483 20	104,606 60	67	15	5	72	13,237 26		
804 86				151	59,937 33	90	6	9	116	27,882 75		
315 96				2,056 58	172,333 08	33	7	4	65	25,144 18		
37 00				145	29,821 74	17	1	3	34	130,735 57		
540 89				135 00	946,775 72	47	1	5	110	55,257 33		
100 00				202 50	1,088,851 19	79	14	5	50	19,289 76		
50 00				146 66	117,210 96	44	5	8	10	926 00		
				22 25	31,858 70	46	2		49	10,615 65		
				53	160,344 10	15	7	1	429	31,798 97		
898 79				82	56,181 50	84	2	2	74	26,899 59		
1,200 00				90	232,359 58	195	5	12	197	62,560 72		
212 54				11,668 74								
				175 00								
418 52				35 00	209,698 80	87	15	10	446	31,963 81		
6,800 89				263	6,691,329 27	35	12	8	138	87,626 80		
86 00				279	90,283 44	8	1	7	74	92,104 31		
1,320 21				124	513,368 82	20	15	13	1,242	266,042 28		
2,000 00				145 22	1,695,271 49	47	6	2	261	42,224 23		
428 38				404 21	1,408,509 80	70	15	17	390	58,442 71		
				698 98	135,070 31	51	9	4	63	188,358 40		
				246 93	1,131,846 19	85	8	6	108	33,901 02		
26 25				2,419 65	4,724,936 77	228	19	21	781	163,274 45	3 00	
1,253 88				685 15	4,716,372 00	396	78	117	2,536	1,194,372 00		
18,773 15				71,609 06								
79,341 72	21 54	172,852 44	8,828	44,388,657 94	4197	435	455	11,893	4,019,342 50	17 10		



## APPENDIX E.—Being a return of business transacted by Surrogate Registrars

County or District.	Total number of Probates issued.	Total number of Letters of Administration issued.	Total number of Letters of Guardianship issued.	Total number of Probates and Letters of Administration issued under R.S.O. Cap. 62, s. 73, ss. 1.	Total number of Probates and Letters issued under R.S.O. Cap. 62, s. 73, ss. 2.	Number of Wills proved istration or Guardianship alty valued as			
						\$100,000, or over.	From \$50,000 to \$100,000.	From \$25,000 to \$50,000.	From \$10,000 to \$25,000.
Algoma.....	35	35	1	7	15				2
Brant.....	80	41	1	13	13		1	2	7
Bruce.....	152	58		17	25	1			7
Carleton.....	211	106	8	8	31		5	4	22
Dufferin.....	37	16		5	8				1
Elgin.....	131	75	3	25	25		1	3	10
Essex.....	128	71	2	24	29		1		7
Frontenac.....	78	58	3	21	17			5	5
Grey.....	140	72	1	16	31		2	3	7
Haldimand.....	48	22	1	6	9				4
Halton.....	56	34		8	5		1	2	10
Hastings.....	100	76	5	24	21				3
Huron.....	196	74	1	21	24		2	5	16
Kenora.....	10	8		3	6				
Kent.....	156	57	3	23	18			5	6
Lambton.....	109	63	2	17	23	1		3	10
Lanark.....	71	42		9	8		2	5	7
Leeds and Grenville.....	100	61	2	13	25		1	5	6
Lennox and Addington.....	43	19		5	4		1		5
Lincoln.....	88	47	2	13	14		1	2	3
Manitoulin.....	9	3		6	5				
Middlesex.....	274	126	6	61	52	4	3	4	16
Muskoka.....	24	10		4	5				1
Nipissing.....	16	28	1	3	9	1			1
Norfolk.....	88	22		15	12				2
Northumberland and Durham.....	148	83		24	24	1	2	1	9
Ontario.....	111	63	1	24	24	1	1		5
Oxford.....	109	56	2	7	21			2	17
Parry Sound.....	18	25		8	11				
Peel.....	67	36	1	11	7		1	1	6
Perth.....	137	40	1	13	21			4	11
Peterborough.....	81	51	1	15	10			1	8
Prescott and Russell.....	67	31		9	9				4
Prince Edward.....	57	22		4	7		1		3
Rainy River.....	11	16							1
Renfrew.....	56	32			20	1		1	1
Simcoe.....	179	99	6	37	27		1	2	10
Stormont, Dundas and Glengarry.....	97	42	6	8	16	1	1	1	6
Sudbury.....	12	34						1	
Temiskaming.....	4	14		5	6	2			
Thunder Bay.....	32	57	1		11			1	2
Victoria.....	58	39	1	26	19				2
Waterloo.....	169	61	3	15	32	1	1	6	14
Welland.....	75	62	1	16	20		1		5
Wellington.....	189	63	3	20	27	2	1	3	14
Wentworth.....	216	90	1	30	22	7	2	16	19
York.....	819	623	21	250	245	20	21	41	86
Totals.....	5,092	2,863	91	889	1,013	43	54	129	381



throughout the Province of Ontario during the year ending 31st December, 1913.

and Letters of Admin- issued where person- follows:				Total amount of personality devolving.	Total amount of realty to be admin- istered under R.S.O. Cap. 119, s. 3.	Amount of moneys in Court in Surro- gate matters, including interest, Con. Rule. 769.	Amount earned for.		
From \$5,000 to \$10,000.	From \$1,000 to \$5 000.	From \$400 to \$1,000.	\$400 and under.				Registrar's fees.	Judge's fees.	Fee fund.
				\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
4	16	15	34	106,636 25	136,138 80		653 93	340 95	145 80
14	40	26	32	456,671 15	343,418 33		1,347 45	791 50	423 10
27	92	27	56	1,920 09	356,840 01		2,071 54	1,253 00	696 00
34	124	58	78	1,566,540 06	160,425 20		3,491 82	2,507 85	1,401 24
4	22	11	15	88,624 63	132,041 15		636 45	260 75	137 80
9	80	30	76	580,605 60	565,666 96		1,954 19	1,195 25	643 10
11	71	34	77	454,770 44	599,935 98	425 80	2,049 76	1,072 50	591 20
22	52	24	30	470,747 30	377,830 00		1,342 35	847 30	472 20
21	95	42	43	730,949 86	427,985 85		2,026 45	1,322 25	731 70
7	24	15	21	176,235 35	170,096 50	164 38	821 54	478 50	206 10
9	44	8	16	436,762 93	488,613 93		1,074 12	716 00	370 80
13	62	41	62	312,429 00	66,808 00		2,171 37	1,011 55	466 40
25	131	27	65	1,037,498 75	120,458 71		3,036 10	1,685 00	967 90
1	8	6	3	14,033 11	15,004 50	15 00	211 10	108 00	41 60
13	92	42	58	529,868 00	46,457 00		1,453 15	1,197 54	653 50
12	74	26	48	690,532 52	434,295 66	235 00	1,766 83	1,273 50	659 40
9	52	21	17	579,518 86	214,778 39		1,518 01	950 25	489 30
22	68	27	34	685,526 07	89,872 00		2,629 07	1,220 75	628 20
6	30	10	10	260,136 86	109,455 00		715 09	606 25	245 00
18	53	29	31	462,417 00	298,229 00		1,455 52	906 25	460 30
.....	5	1	6	13,413 65			134 85	52 10	29 80
40	145	62	132	2,979,958 41	1,107,636 87		4,031 23	3,529 30	1,951 70
.....	13	9	11	52,910 71	42,342 00		317 79	108 50	84 30
2	16	7	18	196,020 47	32,060 00		454 75	333 50	169 20
8	41	23	36	218,014 56	171,114 00	450 00	1,406 49	565 75	283 00
19	95	43	61	819,852 57	461,659 25		2,352 75	1,506 50	815 70
20	76	25	47	588,207 08	380,403 33	1,568 05	2,079 74	1,123 95	579 70
14	76	20	38	616,117 82	454,409 50	7,465 60	2,293 13	1,212 80	587 70
1	13	12	17	38,886 74	41,376 00		268 06	99 00	85 10
13	37	19	27	385,091 00	483,043 00		1,203 08	702 90	378 20
18	71	31	43	685,048 60	416,674 26		1,922 75	1,073 25	632 70
12	49	28	35	390,860 63	295,968 13		1,506 50	998 50	426 40
7	51	13	23	258,115 18	307,307 00		1,089 60	429 25	313 40
5	39	16	15	244,137 72	238,975 00		1,053 43	574 25	255 90
1	8	4	13	48,097 88	69,326 01		214 33	121 50	69 20
7	39	20	19	2,293,900 05			932 09	2,526 00	1,301 80
23	182	38	28	744,146 95	801,439 46		2,720 45	1,472 50	811 10
16	74	25	21	684,300 47	88,881 67		2,059 20	1,173 25	644 50
.....	12	18	15	62,722 58	43,241 00		343 71	157 00	107 70
.....	6	4	8	16,230 27	7,515 00		107 80	35 75	30 00
5	17	13	50	671,615 22	500,393 87		763 67	841 00	465 10
13	38	19	26	1,267,657 60	226,184 66		1,200 28	518 75	28 00
28	88	27	68	1,107,830 55	637,250 01		2,686 82	1,625 50	957 70
11	50	25	46	353,472 18	373,433 55		1,021 30	753 55	414 10
23	127	33	52	1,220,452 00	778,532 00		2,620 13	1,924 00	1,035 90
30	98	45	90	4,381,272 32	1,032,808 37	602 70	3,149 62	5,215 80	2,701 80
124	406	329	436	12,418,277 00	9,789,144 00		15,619 93	17,238 75	8,794 10
721	3,152	1,428	2,187	42,349,034 04	23,935,468 91	10,926 53	85,979 32	65,657 84	34,637 44

**APPENDIX F.—Return of fees and emoluments of the Judicial Officers throughout the officers payable by the Province, the County and the**

County or District and Town.	Office.	Officer	Amount earned.	Salary paid by Province.	Total earnings and salary in all offices.	Total received for present year's services.
<b>ALGOMA :</b>						
Sault Ste. Marie ..	Sheriff .....	W. H. Carney ...	\$ 2,920 64	c. 1,000 00	\$ 3,920 64	\$ 3,249 67
	Surrogate Judge ..	Judge Stone .....		*500 00	585 20	500 00
	Local Master .....	" .....	85 20			77 10
	Crown Attorney...	§ F. J. S. Martin.	Returns not received			
	Clerk of the Peace.	" .....				
	Local Registrar...	C. V. Plummer..	149 00	150 00	2,254 73	274 00
	District Court Cl'k	" .....	701 80	600 00		1,201 80
	Surrogate Registrar	" .....	653 93			653 93
<b>BRANT :</b>						
Brantford.	Sheriff .....	W. W. Ross .....	2,845 05		2,845 05	1,950 07
	Surrogate Judge...	Judge Hardy... Commuted		875 00	945 80	875 00
	Local Master .....	" .....	70 80			70 80
	Crown Attorney ..	A. J. Wilkes, K.C.	1,477 20		2,467 01	1,227 20
	Clerk of the Peace	" .....	989 81			682 57
	Local Registrar...	J. T. Hewitt....	437 88	675 00	3,391 48	1,112 88
	County Court Clerk	" .....	931 15			931 15
	Surrogate Registrar	" .....	1,347 45			1,347 45
<b>BRUCE :</b>						
Walkerton	Sheriff .....	D. M. Jermyn ..	2,187 10		2,187 10	1,685 82
	Surrogate Judge...	Judge Barrett...	1,000 00		1,000 00	
	Local Master .....	Judge Klein.... Commuted		400 00	400 00	
	Crown Attorney...	Thomas Dixon ..	326 30		1,525 89	331 80
	Clerk of the Peace	" .....	1,199 59			851 74
	Local Registrar...	Matthew Goetz..	91 45	675 00	3,623 10	766 45
	County Court Clerk	" .....	785 11			481 92
	Surrogate Registrar	" .....	2,071 54			1,616 76
<b>CARLETON :</b>						
Ottawa ..	Sheriff .....	G. C. Richardson.	10,891 84		10,891 84	9,089 88
	Surrogate Judge...	Judge McTavish.	1,300 00		1,300 00	
	" .....	Judge Gunn....	1,000 00		1,000 00	
	Local Master .....	John Bishop, K.C.	2,279 11		3,221 91	2,279 11
	Deputy Registrar..	" .....	942 80			942 80
	Crown Attorney...	J. A. Ritchie ....	978 63		2,049 64	590 83
	Clerk of the Peace.	" .....	1,071 01			529 05
	Deputy Clerk of the	" .....				
	Crown .....	Horace Pratt ...	547 30	450 00	7,464 37	997 30
	County Court Clerk	" .....	2,975 25			2,975 25
	Surrogate Registrar	" .....	3,491 82			3,491 82
<b>DUFFERIN :</b>						
Orangeville	Sheriff .....	† Henry Endacott	975 89		975 89	559 67
	Surrogate Judge ..	† Judge McCarthy	260 75		283 05	260 75
	Local Master .....	" .....	22 30			22 30
	Crown Attorney...	W. J. L. McKay..	156 15		645 40	78 80
	Clerk of the Peace.	" .....	489 25			240 35
	Local Registrar...	J. A. V. Preston.	80 40	675 00	1,661 00	753 10
	County Court Clerk	" .....	269 15			260 65
	Surrogate Registrar	" .....	636 45			617 15
<b>ELGIN :</b>						
St. Thomas	Sheriff .....	Dugald McColl .	2,342 74		2,342 74	1,743 43
	Surrogate Judge...	Judge Colter... Commuted			1,000 00	
	Local Master .....	C. F. Maxwell ..	367 24		367 24	272 84
	Crown Attorney...	A. McCrimmon..	1,349 55		2,419 08	1,000 20
	Clerk of the Peace.	" .....	1,069 53			608 06
	Local Registrar...	David McLaws..	193 86	675 00	3,401 45	748 36
	County Court Clerk	" .....	578 40			502 15
	Surrogate Registrar	" .....	1,954 19			1,829 74

\*By R.S.O. Cap. 58, S. 17. § Returns not received; Appointed 31st July, 1913.

† O-in-C. 12th Aug., 1913. † Judge Fisher appointed Surrogate Judge 2nd December, 1913.





## APPENDIX F.—Return of fees and emoluments of the Judicial

County or District and Town.	Office.	Officer.	Amount earned.	Salary paid by Province.	Total earnings and salary in all offices.	Total received for present year's services.
			\$ c.	\$ c.	\$ c.	\$ c.
<b>ESSEX:</b>						
Sandwich.	Sheriff .....	J. E. D'Avignon.	3,417 76		3,417 76	2,407 35
	Surrogate Judge...	*Judge Dromgole	280 25		280 25	
	Local Master .....	Henry Clay.....	19 80		19 80	19 80
	Crown Attorney...	J. H. Rodd.....	1,576 01		2,728 44	976 11
	Clerk of the Peace.	" .....	1,152 43			788 51
	Local Registrar...	Francis Cleary..	324 26	675 00	4,086 37	996 26
	County Court Clerk	" .....	1,037 35			1,029 25
	SurrogateRegistrar	" .....	2,049 76			2,049 16
<b>FRONTENAC</b>						
Kingston.	Sheriff .....	Thomas Dawson	2,390 95		2,390 95	1,968 43
	Surrogate Judge...	†Judge Price....	Commuted	752 00		
	Local Master .....	J. B. Walkem, KC	77 50		77 50	48 70
	Crown Attorney...	J. L. Whiting, K.C.	147 00		1,094 14	108 00
	Clerk of the Peace.	" .....	947 14			606 69
	Local Registrar...	T. M. Asselstine	133 30	675 00	1,320 20	808 30
	County Court Clerk	" .....	511 90			511 90
	SurrogateRegistrar	Miss H. Fraser..	1,342 35		1,342 35	1,257 95
<b>GREY:</b>						
Owen Sound..	Sheriff .....	C. H. Moore.....	2,512 66		2,512 66	1,997 74
	Surrogate Judge...	Judge Widdifield	1,000 00		1,057 70	1,000 00
	Local Master .....	" .....	57 70			8 60
	Crown Attorney...	J. Armstrong ...	284 05		1,435 92	219 05
	Clerk of the Peace.	" .....	1,151 87			746 87
	Local Registrar...	W. A. Bishop ..	116 90	750 00	3,770 60	866 90
	County Court Clerk	" .....	877 25			877 25
	SurrogateRegistrar	" .....	2,026 45			2,026 45
<b>HALDIMAND</b>						
Cayuga ..	Sheriff .....	M. McConnell...	2,100 85		2,100 85	1,780 20
	Surrogate Judge ..	Judge Douglas	478 50		514 00	478 50
	Local Master .....	" .....	35 50			25 00
	Crown Attorney...	J. A. Murphy....	555 93		1,959 10	549 93
	Clerk of the Peace.	" .....	1,403 17			1,099 67
	Local Registrar...	J. C. Eccles.....	19 60	600 00	1,794 59	619 60
	County Court Clerk	" .....	353 45			323 65
	SurrogateRegistrar	" .....	821 54			820 54
<b>HALTÓN:</b>						
Milton..	Sheriff .....	S. Webster.....	1,696 54		1,696 54	1,141 12
	Surrogate Judge ..	†Judge Gorham..	716 00		716 50	716 00
	Local Master .....	" .....	0 50			
	Crown Attorney...	W. I. Dick .....	569 89		1,866 56	508 29
	Clerk of the Peace.	" .....	1,296 67			816 87
	Local Registrar...	W. J. McClenahan	49 60	600 00	1,961 72	638 10
	County Court Clerk	" .....	238 00			238 00
	SurrogateRegistrar	" .....	1,074 12			1,074 12
<b>HASTINGS:</b>						
Belleville..	Sheriff .....	M. B. Morrison...	3,680 71		3,680 71	2,370 14
	Surrogate Judge...	Judge Fraleck...	Commuted	985 00		
	Local Master.....	S. S. Lazier... }	Commuted	3,000 00		
	Deputy Registrar..	" .....				
	Crown Attorney...	P. J. M. Anderson	1,762 11		3,075 36	1,265 71
	Clerk of the Peace.	" .....	1,313 25			955 70
	Deputy Cl'k of the Crown.....	John Williams ..	62 30	450 00	4,038 17	512 30
	County Court Cl'k.	" .....	1,354 50			1,354 50
	SurrogateRegistrar	" .....	2,171 37			2,171 37

\* Appointed O.-in-C. 11th July, 1913.

† Judge Lavell appointed Surrogate Judge O.-in-C. 28th March, 1914.

‡ Judge Elliott appointed Surrogate Judge and Local Master O.-in-C. 18th March, 1914.



Officers throughout the Province of Ontario, etc.—Continued.

Total received for past year's ser- vices.	Total receipts by officer from all his offices.	Total disbursements.	Net receipts.	Amount paid to Province under R.S.O. cap. 17.	Net Income.	Earnings of each officer pay- able by the Province, the County, and the General Public, respectively.			County or District.
						From Province.	From County.	From General Public.	
\$ 969 68	c. 3,377 03	\$ 693 26	c. 2,683 77	\$ . . . . .	c. 2,683 77	\$ 1,041 88	c. 593 50	\$ 1,782 38	Essex.
.....	280 25	.....	280 25	.....	280 25	.....	.....	280 25	
.....	19 80	.....	19 80	.....	19 80	.....	.....	19 80	
454 25	2,562 20	592 36	1,969 84	.....	1,969 84	1,198 85	65 86	311 30	
543 33	.....	.....	.....	.....	.....	149 65	803 00	199 78	
.....	4,074 67	571 31	3,503 36	151 68	3,351 68	675 00	.....	324 26	
.....	.....	.....	.....	.....	.....	.....	.....	1,037 35	
.....	.....	.....	.....	.....	.....	.....	.....	2,049 76	
346 50	2,314 93	367 00	1,947 93	.....	1,947 93	659 00	662 43	1,069 52	Frontenac.
.....	752 00	.....	.....	.....	752 00	752 00	.....	.....	
.....	48 70	.....	48 70	.....	48 70	.....	.....	77 50	
18 00	1,081 49	50 00	1,031 49	.....	1,031 49	126 00	.....	.....	
348 80	.....	.....	.....	.....	.....	74 40	872 74	.....	
.....	1,320 20	20 00	1,300 20	.....	1,300 20	675 00	.....	133 30	
.....	.....	.....	.....	.....	.....	.....	.....	511 90	
63 45	1,321 40	50 00	1,271 40	.....	1,271 40	.....	.....	1,342 35	
726 89	2,724 63	1,239 22	1,485 41	.....	1,485 41	858 12	772 38	882 16	Grey.
.....	1,026 90	10 20	1,016 70	.....	1,016 70	.....	.....	1,000 00	
18 30	.....	.....	.....	.....	.....	.....	.....	57 70	
83 00	1,483 25	375 00	1,108 25	.....	1,108 25	259 05	25 00	.....	
434 33	.....	.....	.....	.....	.....	93 95	979 92	78 00	
.....	3,770 60	464 20	3,306 40	111 28	3,195 12	750 00	.....	116 90	
.....	.....	.....	.....	.....	.....	.....	.....	877 25	
.....	.....	.....	.....	.....	.....	.....	.....	2,026 45	
698 06	2,478 26	624 91	1,853 35	.....	1,853 35	1,012 57	620 91	467 37	Haldimand
.....	509 30	.....	509 30	.....	509 30	.....	.....	478 50	
5 80	.....	.....	.....	.....	.....	.....	.....	35 50	
146 20	2,114 45	360 00	1,754 45	.....	1,754 45	451 28	6 85	97 80	
318 65	.....	.....	.....	.....	.....	150 55	1,135 63	116 99	
16 00	1,811 54	142 90	1,668 64	.....	1,668 64	600 00	.....	19 60	
28 55	.....	.....	.....	.....	.....	.....	.....	353 45	
3 20	.....	.....	.....	.....	.....	.....	.....	821 54	
555 93	1,697 05	673 38	1,023 67	.....	1,023 67	553 22	410 06	703 26	Halton
.....	716 00	.....	716 00	.....	716 00	.....	.....	716 00	
.....	.....	.....	.....	.....	.....	.....	.....	50	
169 65	1,941 07	135 12	1,805 95	.....	1,805 95	501 89	.....	68 00	
446 26	.....	.....	.....	.....	.....	110 85	1,145 55	40 27	
.....	1,950 22	342 50	1,607 72	.....	1,607 72	600 00	.....	49 60	
.....	.....	.....	.....	.....	.....	.....	.....	238 00	
.....	.....	.....	.....	.....	.....	.....	.....	1,074 12	
1,050 70	3,420 84	1,469 54	1,951 30	.....	1,951 30	1,554 21	1,032 25	1,094 25	Hastings.
.....	985 00	.....	985 00	.....	985 00	985 00	.....	.....	
.....	3,000 00	584 00	2,416 00	.....	2,416 00	3,000 00	.....	.....	
419 50	2,983 06	310 80	2,672 26	84 45	2,387 81	1,474 76	.....	287 35	
342 15	.....	.....	.....	.....	.....	250 55	1,050 00	12 70	
.....	4,038 17	696 59	3,341 58	118 32	3,223 26	450 00	.....	62 30	
.....	.....	.....	.....	.....	.....	.....	.....	1,354 50	
.....	.....	.....	.....	.....	.....	.....	.....	2,171 37	

## APPENDIX F.—Return of fees and emoluments of the Judicial

County or District and Town.	Office.	Officer.	Amount earned.	Salary paid by Province.	Total earnings and salary in all offices.	Total received for present year's services.
			\$ c.	\$ c.	\$ c.	\$ c.
HURON: Goderich.	Sheriff .....	R. G. Reynolds ..	2,625 97		2,625 97	2,455 14
	Surrogate Judge ..	Judge Doyle ....	Commuted	1,000 00	1,015 10	1,000 00
	Local Master .....	" .....	15 10			
	Crown Attorney ..	C. Seager .....	1,125 45		2,588 18	889 20
	Clerk of the Peace..	" .....	1,462 73			1,325 19
	Local Registrar...	D. McDonald....	36 00	750 00	4,087 60	786 00
	County Court Clerk.	" .....	265 50			265 50
	Surrogate Registrar	" .....	3,036 10			3,036 10
KENORA: Kenora.	Sheriff .....	John W. Humble..	1,426 25	1,000 00	2,426 25	1,587 24
	Surrogate Judge ..	Judge Chapple ..		*500 00	525 00	500 00
	Local Master .....	" .....	25 00			
	Crown Attorney...	J. F. MacGillivray	315 75		890 67	167 73
	Clerk of the Peace..	K.C. " .....	324 92	250 00		401 63
	Local Registrar...	C. W. Chadwick..	24 00	700 00	1,201 56	724 00
	District Court Cl'k.	" .....	266 46			266 46
	Surrogate Registrar	" .....	211 10			211 10
KENT: Chatham.	Sheriff .....	J. R. Gemmill..	2,732 84		2,732 84	1,670 75
	Surrogate Judge...	Judge Bell .....	1,000 00		1,000 00	
	Local Master .....	Thos. Scullard..	66 90		66 90	51 90
	Crown Attorney...	H. D. Smith .....	1,330 73		2,557 34	1,111 61
	Clerk of the Peace..	" .....	1,226 61			1,161 46
	Local Registrar ..	James Holmes ..	116 60	675 00	2,944 95	791 60
	County Court Clerk.	" .....	700 20			700 20
	Surrogate Regist'r.	" .....	1,453 15			1,453 15
LAMBTON: Sarnia.	Sheriff .....	James Flintoft..	2,487 95		2,487 95	1,855 46
	Surrogate Judge...	Judge Macwatt..	Commuted	1,000 00	1,086 41	1,000 00
	Local Master .....	" .....	86 41			84 91
	Crown Attorney...	J. P. Bucke .....	661 23		1,797 53	421 58
	Clerk of the Peace..	" .....	1,136 30			1,096 80
	Local Registrar...	Alex Saunders..	255 12	675 00	3,273 42	930 12
	County Court Clerk.	" .....	576 47			576 47
	Surrogate Regist'r.	" .....	1,766 83			1,766 83
LANARK: Perth.	Sheriff .....	D. G. MacMartin..	1,714 39		1,714 39	1,250 61
	Surrogate Judge...	† Judge Senkler..	950 25		1,057 79	950 25
	Local Master .....	" .....	107 54			
	Crown Attorney...	E. G. Malloch, K.C.	399 07		1,083 97	280 97
	Clerk of the Peace..	" .....	684 90			392 28
	Local Registrar ..	W. P. McEwen..	86 80	675 00	2,603 91	761 80
	County Court Clerk.	" .....	324 10			243 60
	Surrogate Regist'r.	" .....	1,518 01			1,104 50
LEEDS AND GRENVILLE: Brockville.	Sheriff .....	J. A. McCammon	2,727 59		2,727 59	2,153 66
	Surrogate Judge...	Judge McDonald,	Commuted	960 00	1,041 40	960 00
	Local Masters...	" .....	81 40			29 00
		Judge Reynolds..	43 90		43 90	14 80
	Crown Attorney...	M. M. Brown....	998 76		2,136 91	678 70
	Clerk of the Peace..	" .....	1,138 15			688 48
	Local Registrar...	O. K. Fraser .....	317 10	750 00	4,513 59	1,031 38
	County Court Clerk.	" .....	817 42			700 67
	Surrogate Regist'r.	" .....	2,629 07			2,447 12

\*By R.S.O. Cap. 58, Sec. 17.

† Judge Scott appointed Surrogate Judge O-in-C. 30th March, 1914.

Officers throughout the Province of Ontario, etc.—Continued.

Total received for past year's services.	Total receipts by officer from all his offices.	Total disbursements.	Net receipts.	Amount paid to Province under R.S.O., cap. 17.	Net income.	Earnings of each officer payable by the Province, the County, and the General Public, respectively.			County or District.
						From Prov-ince.	From County.	From General Public.	
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	
58 18	2,513 32	562 75	1,950 57	.....	1,950 57	1,140 41	773 39	712 17	Huron
.....	1,000 00	.....	1,000 00	.....	1,000 00	1,000 00	.....	.....	
.....	.....	.....	.....	.....	.....	.....	.....	15 10	
131 68	2,407 16	208 10	2,199 06	19 90	2,179 16	875 12	118 00	132 33	
61 09	.....	.....	.....	.....	.....	168 35	1,100 00	194 38	
.....	4,087 60	969 80	3,117 80	73 56	3,044 24	750 00	.....	36 00	
.....	.....	.....	.....	.....	.....	.....	.....	265 50	
.....	.....	.....	.....	.....	.....	.....	.....	3,036 10	
719 29	2,306 53	618 72	1,687 81	.....	1,687 81	1,959 16	.....	467 19	Kenora
.....	500 00	.....	498 00	.....	498 00	500 00	.....	.....	
.....	.....	2 00	.....	.....	.....	.....	.....	25 00	
146 00	858 45	12 75	845 70	.....	845 70	515 75	.....	.....	
143 07	.....	.....	.....	.....	.....	541 96	.....	32 96	
.....	1,201 56	300 00	901 56	.....	901 56	700 00	.....	24 00	
.....	.....	.....	.....	.....	.....	.....	.....	266 46	
.....	.....	.....	.....	.....	.....	.....	.....	211 10	
692 16	2,362 91	712 70	1,650 21	.....	1,650 21	813 45	881 08	1,038 31	Kent
.....	1,000 00	.....	1,000 00	.....	1,000 00	.....	.....	1,000 00	
10 30	42 20	.....	42 20	.....	42 20	.....	.....	66 90	
219 16	2,574 03	650 00	1,924 03	.....	1,924 03	694 20	.....	636 53	
81 80	.....	.....	.....	.....	.....	153 74	1,000 00	72 87	
.....	2,944 95	674 00	2,270 95	.....	2,270 95	675 00	.....	116 60	
.....	.....	.....	.....	.....	.....	.....	.....	700 20	
.....	.....	.....	.....	.....	.....	.....	.....	1,453 15	
509 15	2,364 61	735 15	1,629 46	.....	1,629 46	1,133 73	509 20	845 02	Lambton
.....	1,084 91	.....	1,077 75	.....	1,077 75	1,000 00	.....	.....	
.....	.....	7 16	.....	.....	.....	.....	.....	86 41	
224 00	1,799 88	20 53	1,779 35	.....	1,779 35	617 23	44 00	.....	
57 50	.....	.....	.....	.....	.....	116 30	1,020 00	.....	
.....	3,273 42	640 00	2,633 42	13 34	2,620 08	675 00	.....	255 12	
.....	.....	.....	.....	.....	.....	.....	.....	576 47	
.....	.....	.....	.....	.....	.....	.....	.....	1,766 83	
415 09	1,665 70	779 62	886 08	.....	886 08	691 91	524 31	498 17	Lanark
.....	971 48	.....	971 48	.....	971 48	.....	.....	950 25	
21 23	.....	.....	.....	.....	.....	.....	.....	107 54	
80 35	1,032 27	125 85	906 42	.....	906 42	283 27	115 80	.....	
278 67	.....	.....	.....	.....	.....	161 78	470 38	52 74	
62 35	2,654 20	271 90	2,382 30	.....	2,382 30	675 00	.....	86 80	
96 35	.....	.....	.....	.....	.....	.....	.....	324 10	
385 60	.....	.....	.....	.....	.....	.....	.....	1,518 01	
440 00	2,593 66	897 85	1,695 81	.....	1,695 81	1,232 29	685 50	809 50	Leeds and Grenville
.....	1,074 60	.....	1,074 60	.....	1,074 60	960 00	.....	.....	
85 60	.....	.....	.....	.....	.....	.....	.....	81 40	
23 88	38 68	.....	38 68	.....	38 68	.....	.....	43 90	
125 06	1,881 75	287 94	1,593 81	.....	1,593 81	972 76	.....	26 00	
389 51	.....	.....	.....	.....	.....	261 80	850 21	26 14	
50 70	4,575 97	556 50	4,019 47	409 73	3,609 74	750 00	.....	317 10	
94 25	.....	.....	.....	.....	.....	.....	.....	817 42	
251 85	.....	.....	.....	.....	.....	.....	.....	2,629 07	



## APPENDIX F—Return of fees and emoluments of the Judicial

County or District and Town.	Office.	Officer.	Amount earned.	Salary paid by Province.	Total earnings and salary in all offices.	Total received for present year's services.
			\$ c.	\$ c.	\$ c.	\$ c.
LENNOX & ADDINGTON: Napanee.	Sheriff .....	G. D. Hawley ...	1,575 97		1,575 97	1,137 44
	Surrogate Judge ..	Judge Madden ...	606 25		606 25	
	Local Master .....	S. S. Lazier.....	18 80		18 80	
	Crown Attorney....	H.M.Deroche,K.C.	231 55		977 54	134 55
	Clerk of the Peace..	" .....	745 99			450 64
	Local Registrar....	W. P. Deroche....	114 70	600 00	1,714 44	714 70
	County Court Clerk.	" .....	284 65			284 65
	Surrogate Regist'r.	" .....	715 09			715 09
LINCOLN: St. Catharines.	Sheriff .....	T. C. Dawson....	3,154 98		3,154 98	1,683 90
	Surrogate Judge ..	Judge Carmen....	Commuted	900 00	940 00	900 00
	Local Master .....	" .....	40 00			40 00
	Crown Attorney....	M. Brennan.....	759 00		2,202 46	559 00
	Clerk of the Peace..	" .....	1,443 46			827 53
	Local Registrar....	Johnson Clench..	259 23	675 00	2,787 25	900 52
	County Court Clerk	" .....	397 50			356 65
	Surrogate Regist'r.	" .....	1,455 52			1,455 52
MANITOULIN: Gore Bay.	Sheriff .....	J. Haddow Fell..	985 88	950 00	1,935 88	1,668 99
	Surrogate Judge....	Judge Hewson....		*500 00	507 30	500 00
	Local Master .....	" .....	7 30			4 70
	Crown Attorney....	W. F. McRae....	269 57		869 09	221 57
	Clerk of the Peace..	" .....	349 52	250 00		451 00
	Local Registrar....	C. C. Platt.....	4 00		1,093 70	4 00
	District Court Cl'k.	" .....	104 85	850 00		954 85
	Surrogate Regist'r.	" .....	134 85			134 85
MIDDLESEX: London.	Sheriff .....	D. M. Cameron ...	4,224 61		4,224 61	3,277 64
	Surrogate Judges. {	Judge Macbeth...	1,300 00		1,300 00	
		Judge Elliott....	1,000 00		1,000 00	
	Local Master.....	+ R. K. Cowan ...	409 97		1,522 47	139 72
	Deputy Registrar..	" .....	1,112 50			1,085 60
	Crown Attorney....	J. B. McKillop ..	1,339 62		3,018 62	835 82
	Clerk of the Peace..	" .....	1,679 00			1,004 35
	Deputy Clerk of the Crown.....	Edmund Weld....	86 40	500 00	5,737 43	586 40
MUSKOKA: Bracebridge.	County Court Clerk.	" .....	1,119 80			989 50
	SurrogateRegistrar	" .....	4,031 23			3,904 80
	Sheriff .....	D. E. Bastedo...	1,565 83	750 00	2,315 83	2,078 35
	Surrogate Judge ..	Judge Mahaffy ..		*500 00	508 00	500 00
	Local Master .....	" .....	8 00			8 00
	Crown Attorney....	Thomas Johnson ..	350 74		1,040 42	301 04
	Clerk of the Peace..	" .....	439 68	250 00		502 77
	Local Registrar....	Isaac Huber.....	40 29	600 00	1,235 01	640 29
NIPISSING: North Bay	District Court Cl'k.	" .....	276 93			276 93
	SurrogateRegistrar	" .....	317 79			317 79
	Sheriff .....	H. C. Varin ....	2,843 33	1,000 00	3,843 33	2,865 62
	Surrogate Judge ..	Judge Valin.....		*500 00	598 10	500 00
	Local Master .....	" .....	98 10			92 90
	Crown Attorney....	T. E. McKee....	574 10		1,292 25	604 88
	Clerk of the Peace..	" .....	468 15	250 00		662 30
	Local Registrar....	T. J. Bourke....	263 60	150 00	2,424 75	413 60
	District Court Cl'k	" .....	1,106 40	450 00		1,556 40
	SurrogateRegistrar	" .....	454 75			454 75

\* By R.S.O. Cap. 58, Sec. 17.

†Died 25th June, 1913.



Officers throughout the Province of Ontario, etc.—Continued.

Total received for past year's ser- vices.	Total receipts by officer from all his offices.	Total disbursements.	Net receipts.	Amount paid to Province under R.S.O., cap. 17.	Net income.	Earnings of each officer pay- able by the Province, the County, and the General Public, respectively.			County or District
						From Prov- ince.	From County.	From General Public.	
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	
389 92	1,527 36	300 27	1,227 09	.....	1,227 09	505 41	551 35	519 21	Lennox and Addington.
.....	606 25	.....	606 25	.....	606 25	.....	.....	606 25	
.....	.....	6 00	.....	.....	.....	.....	.....	18 80	
7 00	850 47	279 20	571 27	.....	571 27	231 55	.....	36 85	
258 28	.....	.....	.....	.....	.....	.....	709 14	114 70	
.....	1,714 79	138 44	1,576 00	.....	1,576 00	600 00	.....	284 65	Lincoln.
.....	.....	.....	.....	.....	.....	.....	.....	715 09	
.....	.....	.....	.....	.....	.....	.....	.....	.....	
502 14	2,186 04	410 05	1,775 99	.....	1,775 99	1,417 46	766 90	970 62	
.....	940 00	.....	940 00	.....	940 00	900 00	.....	40 00	
145 00	2,116 06	250 00	1,866 06	.....	1,866 06	659 00	100 00	.....	Manitoulin.
584 53	.....	.....	.....	.....	.....	151 90	1,141 56	150 00	
12 00	2,748 39	450 00	2,298 39	.....	2,298 39	675 00	.....	259 23	
23 70	.....	.....	.....	.....	.....	.....	.....	397 50	
.....	.....	.....	.....	.....	.....	.....	.....	1,455 52	
123 51	1,792 50	194 79	1,597 71	.....	1,597 71	1,754 89	.....	180 99	Middlesex.
.....	511 60	.....	511 60	.....	511 60	500 00	.....	.....	
6 90	.....	.....	.....	.....	.....	.....	.....	7 30	
.....	805 47	176 99	628 48	.....	628 48	269 57	.....	.....	
132 90	.....	.....	.....	.....	.....	599 52	.....	.....	
.....	1,093 70	.....	1,093 70	.....	1,093 70	.....	.....	4 00	Muskoka.
.....	.....	.....	.....	.....	.....	850 00	.....	104 85	
.....	.....	.....	.....	.....	.....	.....	.....	134 85	
1,027 10	4,304 74	1,770 33	2,534 41	.....	2,534 41	948 00	1,919 73	1,456 88	
.....	.....	.....	1,300 00	.....	1,300 00	.....	.....	1,300 00	
.....	.....	.....	1,000 00	.....	1,000 00	.....	.....	1,000 00	Nipissing
77 50	1,597 32	588 98	1,008 34	.....	1,008 34	.....	.....	409 97	
294 50	.....	.....	.....	.....	.....	.....	.....	1,112 50	
516 66	2,988 47	1,000 00	1,988 00	.....	1,988 00	1,272 82	41 00	25 80	
631 64	.....	.....	.....	.....	.....	251 85	1,249 57	172 58	
.....	5,538 13	2,065 00	3,473 13	144 62	3,328 51	500 00	.....	86 40	Nipissing
.....	.....	.....	.....	.....	.....	.....	.....	1,119 80	
57 43	.....	.....	.....	.....	.....	.....	.....	4,031 23	
227 00	2,305 35	1,191 00	1,114 35	.....	1,114 35	2,019 36	.....	296 57	
.....	508 00	.....	508 00	.....	508 00	500 00	.....	8 00	
103 00	1,170 53	25 50	1,145 03	.....	1,145 03	290 74	.....	60 00	Nipissing
263 72	.....	.....	.....	.....	.....	639 25	.....	50 43	
.....	1,235 01	19 89	1,215 12	.....	1,215 12	600 00	.....	40 29	
.....	.....	.....	.....	.....	.....	.....	.....	276 29	
.....	.....	.....	.....	.....	.....	.....	.....	317 79	
274 31	3,139 93	1,798 07	1,341 86	.....	1,341 86	2,952 38	.....	890 95	Nipissing
.....	592 90	.....	592 90	.....	592 90	500 00	.....	98 10	
233 55	1,722 13	100 00	1,622 13	.....	1,622 13	525 13	.....	48 97	
221 40	.....	.....	.....	.....	.....	718 15	.....	.....	
.....	2,424 75	177 80	2,246 95	.....	2,246 95	150 00	.....	263 60	
.....	.....	.....	.....	.....	.....	450 00	.....	1,106 40	Nipissing
.....	.....	.....	.....	.....	.....	.....	.....	454 75	

## APPENDIX F.—Return of fees and emoluments of the Judicial

County or District and Town.	Office.	Officer.	Amount earned.	Salary paid by Province.	Total earnings and salary in all offices.	Total received for present year's services.
			\$ c.	\$ c.	\$ c.	\$ c.
NORFOLK:						
Simcoe ...	Sheriff .....	F. S. Snider ....	1,934 71	.....	1,934 71	1,484 69
	Surrogate Judge ..	Judge Robb ....	565 75	.....	565 75	.....
	Local Master .....	" .....	.....	.....	.....	.....
	Crown Attorney...	T. R. Slaght, K.C.	785 55	.....	2,949 25	686 05
	Clerk of the Peace.	" .....	2,163 70	.....	.....	1,556 14
NORTHUM-	Local Registrar ..	C. C. Rapelje....	76 55	675 00	2,644 38	723 80
BERLAND	County Court Cl'k.	" .....	486 34	.....	.....	256 44
AND	SurrogateRegistrar	" .....	1,406 49	.....	.....	1,064 31
DURHAM:						
Cobourg ..	Sheriff .....	D. J. Nesbitt ....	3,165 25	.....	3,165 25	2,326 36
	Surrogate Judge ..	Judge Benson ..	commuted	1,000 00	.....	.....
	Local Master ....	Judge Roger ....	41 84	.....	41 84	11 54
	Crown Attorney...	W. F. Kerr.....	1,036 48	.....	2,205 44	744 23
	Clerk of the Peace.	" .....	1,168 96	.....	.....	687 22
	Local Registrar...	John T. Field ...	222 35	750 00	3,905 30	972 35
	County Court Clerk	" .....	580 20	.....	.....	580 20
	SurrogateRegistrar	" .....	2,352 75	.....	.....	2,352 75
ONTARIO:						
Whitby ..	Sheriff .....	J. F. Paxton ....	2,018 80	.....	2,018 80	1,655 18
	Surrogate Judge...	G. Y. Smith.....	1,000 00	.....	1,072 55	1,000 00
	Local Master ..	" .....	72 55	.....	.....	48 20
	Crown Attorney...	J. E. Farewell, KC	766 35	.....	2,176 72	663 45
	Clerk of the Peace.	" .....	1,410 17	.....	.....	898 01
	Local Registrar...	Horace Bascom..	66 44	675 00	3,286 58	741 44
	County Court Cl'k.	" .....	465 40	.....	.....	465 40
	SurrogateRegistrar	" .....	2,079 74	.....	.....	2,079 74
OXFORD:						
Woodstock	Sheriff .....	Wm. McGhee....	2,380 91	.....	2,380 91	1,678 39
	Surrogate Judge ..	Judge Finkle ..	commuted	1,000 00	.....	.....
	Local Master ....	W. T. McMullen.	268 00	.....	319 50	153 00
	Deputy Registrar..	" .....	51 50	.....	.....	9 95
	Crown Attorney...	R. N. Ball .. ...	646 35	.....	1,672 00	542 71
	Clerk of the Peace.	" .....	1,025 65	.....	.....	582 21
	Deputy Clerk of the	" .....	.....	.....	.....	.....
	Crown .....	James Canfield..	138 80	450 00	3,608 98	493 00
	County Court Clerk	" .....	727 05	.....	.....	598 30
	SurrogateRegistrar	" .....	2,293 13	.....	.....	1,861 40
PARRY						
SOUND:						
Parry Sound	Sheriff .....	Sam'l Armstrong	2,353 87	750 00	3,103 87	2,548 73
	Surrogate Judge ..	Judge McCurry..	.....	*500 00	500 00	.....
	Local Master .....	" .....	.....	.....	.....	.....
	Crown Attorney...	W. L. Haight....	515 89	250 00	1,198 20	679 15
	Clerk of the Peace.	" .....	432 31	.....	.....	242 15
	Local Registrar...	E. Jordan.....	104 55	600 00	1,191 26	704 55
	District Court Cl'k.	" .....	218 65	.....	.....	218 65
	SurrogateRegistrar	" .....	266 06	.....	.....	268 06
PEEL:						
Brampton.	Sheriff .....	[son Nathan Hender	1,888 68	.....	1,888 68	1,377 65
	Surrogate Judge...	Judge McGibbon.	702 90	.....	890 42	702 90
	Local Master ....	" .....	187 52	.....	.....	187 52
	Crown Attorney...	W. H. McFadden,	502 74	.....	1,321 64	439 69
	Clerk of the Peace.	K.C. " .....	818 90	.....	.....	623 72
	Local Registrar...	J. B. Dixon.....	257 10	600 00	2,500 99	839 10
	County Court Cl'k.	" .....	440 81	.....	.....	420 81
	SurrogateRegistrar	" .....	1,203 08	.....	.....	1,174 98

\*By R.S.O. Cap. 58, Sec. 17.

†Judge Powell appointed Surrogate Judge by O-in-C. 23rd March, 1914.





## APPENDIX F.—Return of fees and emoluments of the Judicial

County or District and Town.	Office.	Officer.	Amount earned.	Salary paid by Province.	Total earnings and salary in all offices.	Total received for present year's services.
PERTH : Stratford.	Sheriff .....	Thomas Magwood	\$ c. 2,580 11	\$ c. .....	\$ c. 2,580 11	\$ c. 1,794 12
	Surrogate Judge...	Judge Barron ...	commuted	873 00	1,723 00	873 00
	Local Master .....	"	commuted	850 00	.....	850 00
	Crown Attorney...	G. G. McPherson	.....	.....	.....	.....
		K.C.	1,001 30	.....	2,561 90	789 00
	Clerk of the Peace.	"	1,560 60	.....	.....	943 52
	Local Registrar...	E. Sydney Smith	411 40	675 00	4,016 09	1,086 40
	County Court Clerk	" K.C.	1,006 94	.....	.....	953 46
	Surrogate Registrar	"	1,922 75	.....	.....	1,922 75
PETER- BOROUGH: Peterboro'	Sheriff .....	J. A. Hall.....	2,127 56	.....	2,127 56	1,642 46
	Surrogate Judge ..	Judge Huycke ..	998 50	.....	1,183 70	998 50
	Local Master .....	"	185 20	.....	.....	33 00
	Crown Attorney....	R. E. Wood .....	613 25	.....	1,510 84	423 35
	Clerk of the Peace.	"	897 59	.....	.....	449 67
	Local Registrar...	G. J. Sherry.....	529 70	675 00	3,472 95	1,074 32
	County Court Clerk	"	761 75	.....	.....	741 65
	Surrogate Registrar	"	1,506 50	.....	.....	1,506 50
PRESCOTT & RUSSELL: L'Orignal	Sheriff .....	Albert Hagar . .	1,472 65	.....	1,472 65	939 24
	Surrogate Judge ..	Judge	.....	.....	.....	.....
		Constantineau.	429 25	.....	450 35	429 25
	Local Master .....	"	21 10	.....	.....	21 10
	Crown Attorney...	John Maxwell...	376 66	.....	1,246 46	376 66
	Clerk of the Peace.	"	869 80	.....	.....	791 79
	Local Registrar...	Joseph Bélanger.	41 40	675 00	2,160 30	710 70
	County Court Clerk	"	354 30	.....	.....	331 45
	Surrogate Registrar	"	1,089 60	.....	.....	1,023 15
PRINCE EDWARD: Picton....	Sheriff .....	James Gibson ...	1,122 55	.....	1,122 55	953 56
	Surrogate Judge ..	Judge Morrison..	574 25	.....	731 62	574 25
	Local Master .....	"	157 37	.....	.....	157 37
	Crown Attorney....	† R. H. Hubbs ...	65 00	.....	576 12	25 00
	Clerk of the Peace	"	511 12	.....	.....	309 96
	Local Registrar...	Nehemiah Gilbert	14 00	600 00	1,939 03	614 00
	County Court Clerk	"	271 60	.....	.....	271 60
	Surrogate Registrar	"	1,053 43	.....	.....	1,053 43
RAINY RIVER: Fort Frances ..	Sheriff .....	W. A. Baker ....	1,679 44	750 00	2,429 44	1,947 27
	Surrogate Judge...	Judge Fitch.....	.....	*500 00	676 90	500 00
	Local Master....	"	176 90	.....	.....	170 50
	Crown Attorney...	A. D. George, .	319 40	.....	983 30	200 40
	Clerk of the Peace.	"	413 90	250 00	.....	262 90
	Local Registrar...	Wm. H. Elliott..	.....	450 00	963 48	450 00
	District Court Cl'k.	"	299 15	.....	.....	299 15
	Surrogate Regist'r	"	214 33	.....	.....	214 33
RENFREW: Pembroke.	Sheriff .....	Alex. Morris....	2,329 53	.....	2,329 53	2,159 23
	Surrogate Judge...	Judge Fisher....	1,000 00	.....	1,000 00	.....
	Local Master....	"	.....	.....	.....	.....
	Crown Attorney...	J.H.Burritt,K.C..	95 36	.....	778 33	95 36
	Clerk of the Peace.	"	682 97	.....	.....	406 97
	Local Registrar...	H. W. Perrett..	165 16	600 00	1,995 95	765 16
	County Court Clerk	"	298 70	.....	.....	298 70
	Surrogate Registrar	"	932 09	.....	.....	932 09

\* By R.S.O. Cap. 58, Sec. 17.

† Appointed O.-in-C. 12th September, 1913.



Officers throughout the Province of Ontario, etc.—Continued.

Total received for past year's ser- vices.	Total receipts by officer from all his offices.	Total disbursements.	Net receipts.	Amount paid to Province under R.S.O. Cap 17.	Net income.	Earnings of each officer pay- able by the Province, the County, and the General Public respectively.			County or District.
						From Prov- ince.	From County.	From General Public.	
\$ 428 24	2,222 36	\$ 646 30	1,576 06	\$	1,576 06	\$ 920 86	\$ 542 69	\$ 1,116 56	Perth
.....	1,723 00	.....	1,723 00	.....	1,723 00	1,723 00	.....	.....	
107 00	2,344 08	333 00	2,011 08	1 10	2,009 98	496 30	.....	505 00	
504 56	.....	.....	.....	.....	.....	90 30	1,376 35	93 95	
56 00	4,018 61	1,010 35	3,008 26	51 65	2,956 61	675 00	.....	411 40	Peter- borough
.....	.....	.....	.....	.....	.....	.....	.....	1,006 94	
.....	.....	.....	.....	.....	.....	.....	.....	1,922 75	
436 42	2,078 88	807 28	1,271 60	.....	1,271 60	1,076 92	398 15	652 49	
.....	1,135 60	.....	1,135 60	.....	1,135 60	.....	.....	998 50	Prescott and Russell.
104 10	.....	.....	.....	.....	.....	.....	.....	185 20	
124 70	1,461 48	84 00	1,377 48	.....	1,377 48	569 25	44 00	87 00	
463 76	.....	.....	.....	.....	.....	115 95	715 38	78 76	
185 76	3,537 48	627 60	2,909 88	40 98	2,868 90	675 00	.....	41 40	Prince Edward
29 25	.....	.....	.....	.....	.....	.....	.....	354 30	
.....	.....	.....	.....	.....	.....	.....	.....	1,089 60	
476 35	1,415 59	854 65	560 94	.....	560 94	533 55	408 64	271 60	
.....	450 35	.....	450 35	.....	450 35	.....	.....	1,053 43	Rainy River
.....	.....	.....	.....	.....	.....	.....	.....	.....	
.....	1,317 20	32 00	1,285 20	.....	1,285 20	216 91	72 75	176 90	
148 75	.....	.....	.....	.....	.....	90 45	700 59	.....	
.....	2,174 54	513 95	1,660 59	.....	1,660 59	675 00	.....	.....	Renfrew.
5 92	.....	.....	.....	.....	.....	.....	.....	.....	
103 32	.....	.....	.....	.....	.....	.....	.....	.....	
181 98	1,135 54	966 70	268 84	.....	268 84	514 35	475 50	.....	
.....	778 45	.....	773 45	.....	773 45	.....	.....	.....	Rainy River
46 83	.....	5 00	.....	.....	.....	.....	.....	.....	
40 00	567 62	232 00	335 62	.....	335 62	20 00	45 00	.....	
192 66	.....	.....	.....	.....	.....	40 82	448 42	.....	
.....	1,939 03	6 00	1,933 03	.....	1,933 03	600 00	.....	.....	Renfrew.
.....	.....	.....	.....	.....	.....	.....	.....	.....	
427 36	2,374 63	974 09	1,400 54	.....	1,400 54	2,088 48	.....	340 96	
.....	705 50	83 00	622 50	.....	622 50	500 00	.....	.....	
35 00	.....	.....	.....	.....	.....	.....	.....	.....	Renfrew.
363 60	1,167 35	.....	1,167 35	.....	1,167 35	319 40	.....	.....	
340 45	.....	.....	.....	.....	.....	663 90	.....	.....	
.....	963 48	537 50	325 98	.....	325 98	450 00	.....	.....	
.....	.....	.....	.....	.....	.....	.....	.....	299 15	Renfrew.
.....	.....	.....	.....	.....	.....	.....	.....	214 33	
148 15	2,307 38	1,020 90	1,286 48	.....	1,286 48	683 78	991 04	654 71	
.....	1,000 00	.....	1,000 00	.....	1,000 00	.....	.....	1,000 00	
.....	.....	.....	.....	.....	.....	.....	.....	.....	Renfrew.
.....	767 68	240 00	527 68	.....	527 68	95 36	.....	.....	
265 35	.....	.....	.....	.....	.....	65 87	534 87	82 23	
.....	1,995 95	125 00	1,870 95	.....	1,870 95	600 00	.....	165 16	
.....	.....	.....	.....	.....	.....	.....	.....	298 70	Renfrew.
.....	.....	.....	.....	.....	.....	.....	.....	932 09	

## APPENDIX F.—Return of fees and emoluments of the Judicial

County or District and Town.	Office.	Officer.	Amount earned.	Salary paid by Province.	Total earnings and salary in all offices.	Total received for present year's services.
<b>SIMCOE:</b>			\$ c.	\$ c.	\$ c.	\$ c.
Barrie...	Sheriff .....	W. McL. Harvey	2,650 99	.....	2,650 99	2,259 14
	Surrogate Judge...	Judge Vance ..	commuted	1,000 00	.....	.....
	Local Master.....	J. R. Cotter.....	34 28	.....	2,869 22	34 28
	Crown Attorney...	"	1,040 84	.....	.....	713 94
<b>STORMONT,</b>	Clerk of the Peace.	"	1,794 10	.....	.....	1,135 01
<b>DUNDAS</b>	Local Registrar...	John McCosh....	245 70	750 00	2,042 49	995 70
<b>AND</b>	County Court Clerk	"	1,046 79	.....	.....	1,046 79
<b>GLEN-</b>	Surrogate Regist'r.	E. A. Little.....	2,720 45	.....	2,720 45	2,720 45
<b>GARRY:</b>						
Cornwall..	Sheriff .....	W. R. Mack.....	2,746 57	.....	2,746 57	2,230 39
	Surrogate Judge...	Judge O'Reilly..	1,000 00	.....	1,440 00	1,000 00
	Local Master.....	"	Commuted	440 00	.....	440 00
	Crown Attorney...	James Dingwall.	385 80	.....	1,191 49	249 27
	Clerk of the Peace.	"	805 69	.....	.....	478 12
	Local Registrar...	J. A. McDougald	55 70	750 00	3,727 55	805 70
	County Court Clerk	"	862 65	.....	.....	862 65
	Surrogate Regist'r.	"	2,059 20	.....	.....	2,059 20
<b>SUDBURY:</b>						
Sudbury..	Sheriff .....	Alex. Irving ....	5,391 42	\$950 00	6,341 42	4,949 13
	Surrogate Judge...	Judge Kehoe ....	.....	500 00	523 20	500 00
	Local Master.....	"	23 20	.....	.....	10 30
	Crown Attorney...	R. R. McKessock,	3,854 25	.....	4,736 21	3,854 25
		K.C.	.....	.....	.....	.....
	Clerk of the Peace.	"	631 96	250 00	.....	881 96
	Local Registrar...	John D. Shipley .	229 80	150 00	2,461 91	379 80
	Dist. Court Clerk..	"	1,288 40	450 00	.....	1,738 40
<b>TEMISKAM-</b>	Surrogate Regist'r.	"	343 71	.....	.....	343 71
<b>ING:</b>						
Haileybury.	Sheriff .....	†George Caldbick	2,271 48	*460 71	2,732 19	2,025 22
	Surrogate Judge...	†Judge Hartman ..	.....	*228 40	228 40	208 30
	Local Master.....	"	20 10	.....	.....	20 10
	Crown Attorney...	†F. L. Smiley...	889 51	.....	.....	171 80
	Clerk of the Peace.	"	246 14	*187 50	1,323 15	149 90
	Local Registrar...	†T. J. Meagher..	237 55	.....	1,101 22	237 55
<b>THUNDER</b>	District Court Clerk	"	473 75	*282 12	.....	755 87
<b>BAY:</b>	Surrogate Registrar	"	107 80	.....	.....	107 80
<b>Port Ar-</b>						
<b>thur . . .</b>	Sheriff .....	A. W. Thompson.	7,580 96	1,000 00	8,580 96	6,801 37
	Surrogate Judge...	Judge O'Leary ..	.....	*500 00	547 70	500 00
	Local Master.....	"	44 70	.....	.....	6 30
	Crown Attorney...	W.F. Langworthy	1,959 10	.....	2,722 40	1,340 60
	Clerk of the Peace.	" [K.C.]	513 30	250 00	.....	451 30
	Local Registrar...	T. S. T. Smellie.	919 93	150 00	3,428 40	1,069 93
	Dist. Court Clerk..	"	1,144 80	450 00	.....	1,594 80
	Surrogate Regist'r.	"	763 67	.....	.....	763 67
<b>VICTORIA:</b>						
Lindsay..	Sheriff .....	John McLennan .	1,272 11	.....	1,272 11	1,012 76
	Surrogate Judge...	Judge McMillan.	518 75	.....	518 75	.....
	Local Masters... {	Judge Harding ..	20 30	.....	20 30	20 30
	Crown Attorney...	A. P. Devlin ....	51 00	.....	522 35	43 00
	Clerk of the Peace.	"	471 35	.....	.....	278 10
	Local Registrar...	J. Sootheran....	115 85	675 00	2,489 28	790 85
	County Court Clerk	"	498 15	.....	.....	498 15
	Surrogate Regist'r.	"	1,200 28	.....	.....	1,200 28

† From 16th May, 1913. ‡ From 6th August, 1913, and Local Master by O-in-C. 26th Sept., 1913.

\* Portion of salary received. † Appointed from 1st November by O-in-C. 9th October.

‡ O-in-C. 31st October, 1913. § By R.S.O. Cap. 58, Sec. 17, §200 of which is salary as District Treasurer.





## APPENDIX F.—Return of fees and emoluments of the Judicial

County or District and Town.	Office.	Officer.	Amount earned.	Salary paid by Province.	Total earnings and salary in all offices.	Total received for present year's services.
<b>WATERLOO:</b>						
Berlin...	Sheriff .....	Henry G. Lackner	\$ 2,331 20	\$ c.	\$ 2,331 20	\$ 1,813 26
	Surrogate Judge...	Judge Chisholm	1,000 00	.....	1,000 00	.....
	Local Master.....	J. J. A. Weir ...	124 20	.....	124 20	20 50
	Crown Attorney ...	W.H.Bowlby, K.C.	744 50	.....	1,869 80	557 50
	Clerk of the Peace...	"	1,125 30	.....	.....	1,056 30
	Local Registrar...	E. J. Beaumont..	337 17	675 00	1,915 40	1,012 17
	County Court Clerk	"	903 23	.....	.....	548 82
	Surrogate Regist'r.	John M. Scully.	2,686 82	.....	2,686 82	2,525 44
<b>WELLAND:</b>						
Welland..	Sheriff .....	James Smith....	2,201 04	.....	2,201 04	1,754 80
	Surrogate Judge...	*Judge Wells....	753 25	.....	834 75	753 25
	Local Master.....	"	81 50	.....	.....	81 50
	Crown Attorney ...	T. D. Cowper....	1,340 00	.....	3,737 24	972 00
	Clerk of the Peace...	"	2,397 24	.....	.....	1,361 88
	Local Registrar...	J. E. Cohoe.....	162 80	800 00	2,372 40	962 80
	County Court Clerk	"	388 30	.....	.....	388 30
	Surrogate Regist'r.	"	1,021 30	.....	.....	1,021 30
<b>WELLINGTON:</b>						
Guelph...	Sheriff .....	A. S. Allan .....	2,300 33	.....	2,300 33	1,837 02
	Surrogate Judge...	Judge Chadwick.	Commuted	1,000 00	.....	.....
	Local Master.....	W.H.Kingston, }	Commuted	2,000 00	.....	.....
	Local Registrar.. }	K.C. }	.....	.....	.....	.....
	Crown Attorney...	†A.H. Macdonald,	.....	.....	.....	.....
		K.C.	257 95	.....	1,154 25	81 00
	Clerk of the Peace...	"	896 30	.....	.....	730 64
	County Court Clerk	Wm. Carroll ....	905 15	.....	3,525 28	878 05
	Surrogate Regist'r.	"	2,620 13	.....	.....	2,354 73
<b>WENTWORTH:</b>						
Hamilton	Sheriff .....	J. T. Middleton..	8,045 39	.....	8,045 39	6,659 42
	Surrogate Judge...	Judge Snider...	1,500 00	.....	1,500 00	.....
		Judge Monck....	1,000 00	.....	1,185 60	1,000 00
	Local Master.....	"	185 60	.....	.....	.....
	Deputy Registrar	†T. H. A. Begue.	.....	.....	.....	.....
		K.C.	28 00	250 00	278 00	216 34
	Crown Attorney ...	S. F. Washington,	.....	.....	.....	.....
		K.C.	5,199 80	.....	7,648 89	3,531 46
	Clerk of the Peace...	"	2,449 09	.....	.....	1,597 92
	Deputy Clerk of the		.....	.....	.....	.....
	Crown .....	T.H.A.Begue, K.C.	213 15	500 00	6,373 75	713 15
	County Court Clerk	"	2,510 98	.....	.....	2,510 98
	Surrogate Regist'r.	"	3,149 62	.....	.....	3,149 62
<b>YORK:</b>						
Toronto	Sheriff .....	§Alex. Cowan ...	12,154 76	.....	12,154 76	9,406 40
		Judge Winchester	2,600 00	.....	2,600 00	.....
	Surrogate Judges {	Judge Morgan...	1,600 00	.....	1,600 00	.....
		Judge Morson...	1,600 00	.....	1,600 00	.....
		Judge Denton ...	1,600 00	.....	1,600 00	.....
	Crown Attorney...	R. H. Greer .....	8,819 66	.....	8,819 66	5,638 60
	Clerk of the Peace...	H. E. Irwin, K.C.	9,394 48	.....	9,394 48	6,151 45
	County Court Clerk	John Richardson.	13,333 45	.....	13,333 45	13,333 45
	Surrogate Regist'r.	Arthur F. Wallis.	15,619 93	.....	15,619 93	15,619 93
<b>TORONTO:</b>						
	Sheriff .....	Fred'k Mowat...	28,447 84	.....	28,447 84	24,739 58
	Crown Attorney...	J.W.S.Corley, K.C.	Commuted	5,500 00	.....	.....

\* Judge Livingstone appointed Surrogate Judge, O.-in-C., 21st October, 1913; Local Master, O.-in-C., 26th January, 1914.

† Appointed from 1st July, 1913; O.-in-C. 16th July, 1913.

‡ Acting.

§ Appointed 2nd September, 1913.



Officers throughout the Province of Ontario, etc.—Concluded.

Total received for past year's services.	Total receipts by officer from all his offices.	Total disbursements.	Net receipts.	Amount paid to Province under R.S.O. cap. 17.	Net income.	Earnings of each officer payable by the Province, the County, and the General Public, respectively.			County or District.
						From Province.	From County.	From General Public.	
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	
352 33	2,165 59	1,049 44	1,116 15	.....	1,116 15	1,143 58	492 26	695 36	Waterloo.
.....	1,000 00	.....	1,000 00	.....	1,000 00	.....	.....	1,000 00	
3 70	24 20	2 80	21 40	.....	21 40	.....	.....	124 20	
114 50	1,755 30	230 00	1,525 30	.....	1,525 30	744 50	.....	.....	
27 00	.....	.....	.....	.....	.....	110 80	1,000 00	14 50	
.....	1,630 34	307 45	1,322 89	.....	1,322 89	675 00	.....	337 17	Welland.
69 35	.....	.....	.....	.....	.....	.....	.....	903 33	
231 75	2,757 19	504 77	2,252 42	.....	2,252 42	.....	.....	2,686 82	
495 42	2,250 22	961 55	1,288 67	.....	1,288 67	753 61	767 78	679 65	
.....	834 75	.....	834 75	.....	834 75	.....	.....	753 25	
230 00	3,284 22	714 00	2,570 22	64 04	2,506 18	812 00	528 00	81 50	Wellington.
720 34	.....	.....	.....	.....	.....	129 30	2,267 94	.....	
.....	2,372 40	398 80	1,973 60	.....	1,973 60	800 00	.....	162 80	
.....	.....	.....	.....	.....	.....	.....	.....	388 00	
.....	.....	.....	.....	.....	.....	.....	.....	1,021 30	
319 97	2,156 99	841 05	1,315 94	.....	1,315 94	865 64	626 77	807 92	Wentworth.
.....	1,000 00	.....	1,000 00	.....	1,000 00	1,000 00	.....	.....	
.....	2,000 00	.....	2,000 00	.....	2,000 00	2,000 00	.....	.....	
.....	811 64	150 00	661 64	.....	661 64	257 95	.....	.....	
16 20	3,348 83	353 55	2,995 28	49 52	2,945 76	39 40	850 00	6 90	
99 85	.....	.....	.....	.....	.....	.....	.....	905 15	York.
1,357 66	8,017 08	2,510 05	5,507 03	.....	5,507 03	4,026 83	851 93	3,166 63	
.....	1,500 00	.....	1,500 00	.....	1,500 00	.....	.....	1,500 00	
.....	1,000 00	.....	1,000 00	.....	1,000 00	.....	.....	1,000 00	
.....	.....	.....	.....	.....	.....	.....	.....	185 60	
41 66	258 00	125 00	133 00	.....	133 00	250 00	.....	28 00	Toronto.
1,294 60	7,060 26	1,854 40	5,205 86	1,152 93	4,052 93	5,156 80	.....	43 00	
636 28	.....	.....	.....	.....	.....	742 45	1,603 84	102 80	
.....	6,373 75	1,840 31	4,533 44	666 72	3,866 72	500 00	.....	213 15	
.....	.....	.....	.....	.....	.....	.....	.....	2,510 98	
1,828 30	11,234 70	4,284 25	6,950 47	.....	6,950 47	7,818 62	865 61	3,470 53	Toronto.
.....	.....	.....	2,600 00	.....	2,600 00	2,600 00	.....	.....	
.....	.....	.....	1,600 00	.....	1,600 00	1,600 00	.....	.....	
.....	.....	.....	1,600 00	.....	1,600 00	1,600 00	.....	.....	
.....	.....	.....	1,600 00	.....	1,600 00	1,600 00	.....	.....	
2,345 40	7,984 00	2,139 40	5,844 60	1,472 30	4,372 30	.....	.....	.....	Toronto.
2,395 41	8,546 86	3,467 00	5,079 86	1,089 93	3,989 93	3,222 00	5,962 18	210 30	
0 70	13,334 15	3,299 85	10,034 30	5,430 87	4,603 43	.....	.....	13,333 45	
.....	15,619 93	4,112 25	11,507 68	6,756 92	4,750 76	.....	.....	15,619 93	
2,751 29	27,490 87	11,839 87	15,651 00	8,235 90	7,415 10	5,695 74	436 71	22,315 39	
.....	5,500 00	.....	5,500 00	.....	5,500 00	5,500 00	.....	.....	

APPENDIX G.—Table showing the business of the High Court Division of the Supreme Court of Ontario, transacted in York County during 1913, compiled from statements furnished by the officers at Osgoode Hall.

Writs of summons issued .....	1,878
Actions entered in Procedure Book commenced by writs issued during the year 1913...	1,212
"                    "                    "                    "                    previous years..	35
"                    "                    "                    "                    otherwise than by writ.....	365
Præcipe Orders issued .....	612
Court " " .....	524
Chamber " " .....	3,294
Records passed .....	524
Actions entered for trial with Jury .....	95
"                    "                    without a Jury.....	415
Actions tried with a Jury .....	71
"                    "                    without a Jury .....	193
Judgments entered in default of appearance or pleading.....	171
"                    "                    without trial .....	135
"                    "                    after trial .....	146
Interlocutory judgments .....	8
Judgments dismissing actions .....	47
"                    for administration .....	5
"                    of the Master in Chambers.....	55
"                    under Con. Rule 938 (now Rule 600).....	37
"                    "                    596 (now Rule 467) .....	26
"                    in mechanics' lien actions .....	72
"                    of reference.....	12
"                    official referees.....	31
"                    entered in respect of Writs issued in the year 1906.....	1
"                    "                    "                    "                    1907.....	1
"                    "                    "                    "                    1908 .....	0
"                    "                    "                    "                    1909 .....	3
"                    "                    "                    "                    1910.....	10
"                    "                    "                    "                    1911.....	36
"                    "                    "                    "                    1912.....	207
"                    "                    "                    "                    1913.....	487
Total judgments entered.....	745
Amount recovered on Judgments (exclusive of costs) .....	\$1,406,200 68
Amount of Taxed costs (including disbursements) on judgments of all kinds .....	\$19,072 27
Writs of Execution Fi. Fa. issued .....	387
"                    renewed, and Alias and Pluries Writs issued .....	131
Special writs (Habeas Corpus, etc.) issued .....	27
Amount of Jury fees paid City Treasurer .....	\$270 00
Petitions under The Quieting Titles Act .....	19
Certificates of Title under The Quieting Titles Act.....	16
Accountant's office:	
Amount of moneys paid into Court .....	\$3,891,085 16
"                    "                    "                    out of Court.....	4,255,370 97
Number of directions issued for payments of moneys into Court.....	1,650
"                    cheques issued .....	5,156
"                    certificates issued .....	188
"                    new accounts opened .....	1,105
"                    individual accounts .....	850
Orders issued by the Master in Ordinary, in Winding-up Matters .....	45
References brought into the office of the Master in Ordinary:	
Trustees accounts.....	1
Partition or sale .....	3
Foreclosure .....	18
Administration .....	4
Title .....	1
Partnership accounts.....	0
Alimony .....	1
Winding up .....	13
Lunacy .....	3
Executors' accounts.....	0
Mechanics' liens .....	0

APPENDIX G.—Table showing the business of the High Court Division of the Supreme Court of Ontario, transacted in York County, etc.—Continued.

Sale.....	1	
Damages.....	4	
Redemption or sale.....	1	
Receivership.....	0	
Settling conveyances.....	0	
Specific performance.....	1	
Accounts.....	10	
	<hr/>	
	61	
References before Official Referees —		
Specific Performance.....	0	
Trial or assessment.....	3	
Trustees and Executors' accounts.....	1	
Winding up.....	25	
Lunacy.....	0	
Accounts.....	0	
Mechanics' liens.....	361	
Title.....	1	
Partition or sale.....	0	
Administration.....	1	
Receivership.....	6	
Foreclosure.....	0	
Under Arbitration Act.....	0	
Vendor and Purchaser.....	0	
	<hr/>	
	398	
Fees paid in law stamps (Stamps cancelled by Taxing officers not included):		
Central office ... { Clerk Records and Writs .....	\$8,827 90 }	\$10,995 50

APPENDIX H.—Table showing the number of actions tried or otherwise disposed of by the Judges of the High Court Division and of the Divisional Courts of the Appellate Division of the Supreme Court of Ontario, and the disposition thereof during the year ending Dec. 31st, 1913.

Trial Judges.

Actions tried or otherwise disposed of by the Judges of the High Court Division of the Supreme Court of Ontario.

County or District.	With a Jury.	Without a Jury.	Total.
Algoma.....	4	.....	4
Brant .....	1	7	8
Bruce .....	4	10	14
Carleton .....	13	62	75
Dufferin .....	1	1	2
Elgin.....	2	11	13
Essex.....	6	24	30
Frontenac .....	5	.....	5
Grey.....	2	8	10
Haldimand .....	3	.....	3
Halton .....	.....	3	3
Hastings.....	3	11	14
Huron.....	3	8	11
Kenora .....	.....	1	1
Kent.....	2	10	12
Lambton .....	3	11	14
Lanark.....	1	2	3
Leeds and Grenville .....	2	8	10
Lennox and Addington .....	2	6	8
Lincoln.....	4	8	12
Manitoulin.....	.....	.....	0
Middlesex .....	16	17	33
Muskoka.....	3	.....	3
Nipissing.....	3	5	8
Norfolk.....	1	.....	1
Northumberland and Durham .....	3	2	5
Ontario .....	2	4	6
Oxford.....	2	7	9
Parry Sound.....	2	.....	2
Peel.....	2	2	4
Perth.....	7	7	14
Peterborough .....	2	8	10
Prescott and Russell .....	1	5	6
Prince Edward .....	.....	.....	0
Rainy River .....	.....	8	8
Renfrew .....	1	3	4
Simcoe .....	2	8	10
Stormont, Dundas and Glengarry.....	2	11	13
Sudbury .....	7	8	15
Temiskaming .....	9	5	14
Thunder Bay .....	8	16	24
Victoria .....	.....	1	1
Waterloo .....	.....	11	11
Welland .....	2	18	20
Wellington.....	.....	6	6
Wentworth .....	16	50	66
York.....	71	193	264
Totals .....	223	586	809



APPENDIX H.—Table showing the number of actions tried, etc.—Continued.

Judges in Chambers.	Allowed or varied.	Dismissed.	Standing for Judgment.	Total
Toronto:				
Appeals from the Masters in Chambers .....	6	23	.....	29
“ Acting Masters in Chambers .....	23	15	.....	38
“ Local Masters and other officers acting in Chambers .....	5	10	.....	15
Appeals from Official Referees .....			.....	
“ Local Taxing Officers .....	1	1	.....	2
“ Taxing Officers at Toronto .....		1	.....	1
Motions, other than appeals .....				1,465
Ottawa:—				
Appeals from Local Masters and other officers acting in Chambers .....			.....	
Appeals from Taxing Officers .....			.....	
Motions, other than appeals .....	13	2	3	18
London:—				
Appeals from Local Masters or other officers acting in Chambers .....		2	.....	2
Motions, other than appeals .....	30	1	.....	31
Totals .....	78	55	3	1,601

Weekly Courts.	Allowed.	Dismissed.	Standing for Judgment or Abandoned.	Total.
Toronto:—				
Appeals from reports and orders of Local Masters and Official Referees .....	11	12	.....	23
Appeals from awards and motions to set aside awards .....	1	2	.....	3
Motions, other than appeals .....	640	72	3	715
Number struck off the list, no one appearing .....				13
“ of motions enlarged .....				216
Ottawa:—				
Appeals from Local Judges .....			.....	
Appeals from reports of Local Masters and Official Referees .....	2	2	.....	4
Motions, other than appeals .....	22	2	4	28
London:—				
Motions, other than appeals .....	23		.....	23
Appeals from reports of Local Masters and Official Referees .....	2		.....	2
Totals .....	701	90	7	1,027

## \*Master in Chambers:—

Motions in respect of pleadings, for particulars, for discovery and for commissions to take evidence .....	207
Motions in respect of venue, to set aside jury notices and notices of trial and proceedings under quo warranta .....	43
Motions for judgments and orders .....	281
Motions setting aside judgments or orders, staying trials, and dismissing actions ..	239
Miscellaneous motions .....	287
Ex parte motions .....	117
Motions taken by the Master-in-Ordinary and Official Referees acting for the Master in Chambers .....	914
Total .....	2,088

\* In 118 cases judgment was reserved and given in writing by the Master. They appear in the Ontario Weekly Notes and Ontario Weekly Reporter.



APPENDIX J.—Table showing the Criminal business of the High Court Division of the Supreme Court of Ontario at its sittings throughout the Province during the year 1913

County or District.	Bills.		Nolle prosequi.	Indictments quashed.	Traversed to the Sessions.	Number of persons pleading guilty.	Number of persons tried.		Verdicts after trial.				Number of days of sittings.
	True.	No.					With a Jury.	Without a Jury.	Guilty.	Not guilty.	Disagreed.	Reserved.	
Algoma.....	15	.....	.....	.....	1	2	11	.....	9	2	1	.....	8
Brant.....	3	.....	.....	.....	.....	.....	3	.....	1	2	.....	.....	3
Bruce.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Carleton.....	3	1	2	.....	.....	.....	3	.....	1	1	1	.....	4
Dufferin.....	1	.....	.....	.....	.....	.....	1	.....	.....	1	.....	.....	3
Elgin.....	1	.....	.....	.....	1	.....	1	.....	.....	.....	1	.....	1
Essex.....	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1
Frontenac.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Grey.....	5	.....	.....	.....	.....	.....	7	.....	5	2	.....	.....	12
Haldimand.....	2	.....	.....	.....	.....	.....	2	.....	.....	2	2	.....	4
Halton.....	2	2	.....	.....	.....	.....	2	.....	2	.....	.....	.....	3
Hastings.....	1	2	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1
Huron.....	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	6
Kenora.....	1	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	2
Kent.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lambton.....	*8	.....	.....	.....	†	.....	2	.....	2	.....	.....	.....	4
Lanark.....	1	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	3
Leeds and Grenville.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lennox and Addington.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lincoln.....	2	.....	.....	.....	2	.....	1	.....	.....	.....	.....	.....	3
Manitoulin.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Middlesex.....	1	.....	.....	.....	.....	.....	1	.....	.....	1	.....	.....	1
Muskoka.....	2	2	.....	.....	.....	.....	2	.....	.....	2	.....	.....	3
Nipissing.....	5	.....	.....	.....	.....	.....	3	.....	3	2	.....	.....	4
Norfolk.....	1	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	5
Northumberland & D'm.....	3	1	.....	.....	.....	1	2	.....	2	.....	.....	.....	9
Ontario.....	1	.....	1	.....	.....	.....	1	.....	.....	.....	1	.....	.....
Oxford.....	2	.....	.....	.....	.....	.....	1	.....	.....	1	.....	.....	3
Parry Sound.....	1	.....	.....	.....	.....	.....	1	.....	.....	1	.....	.....	1
Peel.....	2	.....	.....	.....	.....	.....	2	.....	.....	.....	2	.....	2
Perth.....	1	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	3
Peterborough.....	2	.....	.....	.....	2	.....	2	.....	1	1	.....	.....	4
Prescott and Russell.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Prince Edward.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rainy River.....	6	1	.....	.....	.....	.....	6	.....	3	3	.....	.....	5
Renfrew.....	1	.....	.....	.....	.....	.....	1	.....	.....	1	.....	.....	1
Simcoe.....	1	.....	.....	.....	.....	.....	1	.....	.....	1	.....	.....	1
Stormont, D's and G'y.....	2	.....	.....	.....	.....	1	1	1	1	1	.....	.....	2
Sudbury.....	5	1	.....	.....	.....	.....	5	.....	3	2	.....	.....	6
Temiskaming.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Thunder Bay.....	7	.....	2	.....	1	.....	4	.....	2	1	1	.....	5
Victoria.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Waterloo.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Welland.....	2	.....	.....	.....	.....	.....	1	.....	.....	2	.....	.....	1
Wellington.....	2	.....	.....	.....	.....	.....	2	.....	1	1	.....	.....	3
Wentworth.....	4	1	.....	.....	.....	2	2	.....	2	.....	.....	.....	2
York.....	19	4	1	2	.....	3	6	.....	3	3	.....	.....	22
Totals.....	116	15	6	2	7	10	81	1	45	32	9	.....	140

\* Four indictments against one person. † 3 stayed on order of Attorney General.

‡ Taken from the Jury.

¶ Adjudged insane and unable to conduct defence





Muskoka.....	1	1	4	1	8	1	4	3	1	11	1	3	11
Nipissing.....	1	1	4	1	8	8	4	4	1	12	1	2	14
Norfolk.....	4	1	8	5	14	1	11	3	1	11	1	8	11
Northumberland and Durham.....			6		32		20	6		30	2	4	56
Ontario.....			8		29		25	4		28	1		31
Oxford.....			11		11		10	1		9	2		8
Parry Sound.....					11		5	4	1	11			7
Peel.....			1		8		7	1		8	1	6	10
Perth.....			6		14		5	3		14		4	18
Peterborough.....			4		8		8	2		10			11
Prescott and Russell.....			11		10		8			10			11
Prince Edward.....			2		10		8	2		10		2	2
Rainy River.....	3		1				8			1			2
Renfrew.....			1	2	2	2	2	2		2		7	2
Simcoe.....			7	5	4	20	7	13		20			4
Stormont, Dundas and Glengarry.....	2		1	4	1	1	5	3		5	2	6	6
Sudbury.....	5		5	1	19	1	9	1		19		4	19
Temiskaming.....	2		27	2	27		12	15		25	2	2	18
Thunder Bay.....	10	2	4	10	31	5	19	1		30	1	9	53
Victoria.....													
Waterloo.....			13	5	8		6	2		8			15
Welland.....			18	12	6		4	2		16	2	5	17
Wellington.....			17	9	5		3	2		14			22
Wentworth.....	10	1	147	54	139	3	41	3		128	11	18	51
York.....	227	28	400	172	440	20	132	20	2	399	52	125	136
Totals.....	306	38	564	114	1,143	43	534	55	18	321,170	89	270	988

\* Return not received.

## APPENDIX "L."

Explanatory circular of Mr. Justice Middleton, which accompanied the draft of the new rules, setting out his reasons for the more important of the changes made in the rules.

OSGOODE HALL,  
10TH APRIL, 1913.

DEAR SIR,—In pursuance of instructions received from Sir James P. Whitney, (acting Attorney-General), I have prepared a draft revision of the Rules of Practice and Tariff of Costs.

By the courtesy of the Attorney-General, I am permitted to submit my draft of these rules for criticism before reporting to him; and I am transmitting to you herewith the result of my labours, for your perusal and consideration. If on perusal you find occasion, I shall be glad if you will, at your early convenience, communicate with me, so that any changes which may be deemed desirable may be made before I send my report to the Government.

When the Judicature Act of 1881 was passed, a schedule of rules was also enacted, taken from the English Judicature Act of 1873. These rules did not purport to deal with the entire practice of the Court, but provided that in matters not dealt with the practice of the Courts consolidated that was most convenient should be followed. This brought about much confusion, as standards of convenience differed; and in 1888 a revision of the rules took place, when an endeavour was made to formulate a complete code of practice. To the rules originally introduced from England were added others having an English origin, and many of our former Chancery Orders and Common Law rules; but throughout this revision there were many provisions that the practice should be as in the "Court of Chancery prior to the Judicature Act."

In 1897, the rules were again revised. Many of these allusions to former practice were eliminated, and much was done to remove difficulties that had developed in the working of the former rules; yet the composite origin of the system was plainly apparent, and there remained a lack of uniformity of expression arising from this. In many cases, also, there was an overlapping of provisions adopted from different sources, which occasioned obscurity and confusion.

In the present revision my endeavour has been to complete the assimilation thus begun, and the elimination of references to former practice. Comparatively few of those now engaged in practice had any experience before the Judicature Act, and any allusions to the practice, either at law or in equity, prior to 1881 are to the majority meaningless, and the occasion of needless research.

Many of the rules which contained no express reference to any prior practice were originally prepared for the purpose of modifying the practice then existing, and are only to be understood in the light of the situation at the time they were enacted. These provisions are frequently negative in form, and amount to no more than the repeal of former rules, or, more frequently, the annulling of a practice that had grown up apart from any express enactments.

Many other rules had their origin in an attempt to meet some particular difficulty, and have now become unnecessary by reason of some more far-reaching change in the practice or in the general law.

Other provisions had their origin in a Statute passed to remedy some particular matter: the main provision of the Statute being accompanied by a number of ancillary provisions, in some cases differing in detail from somewhat similar general provisions of the rules, but now not necessary, by reason of wide general provisions. In this revision I have endeavoured to make the rules a consistent whole, capable of being understood without any reference to the origin of the particular rule or to any former practice.

I have also endeavoured to reduce the practice to the greatest possible degree of simplicity, and so to classify the rules that what is required to be known may be readily found. To this end, general provisions have been made, applicable to all procedure, and in this way much repetition is made unnecessary, e.g., in the former revisions almost every section conferring power upon the Court directed it to be exercised "upon such terms as to costs and otherwise as may be just"; and almost every time limit is accompanied by the expression "or such further or other time as the Court or Judge may allow." The disappearance of these familiar expressions does not mean change, but merely that general provisions apply and render repetition unnecessary.

Another familiar expression eliminated is "the Court or a Judge." This expression had its origin in the theory that the expression "the Court" referred to the Court sitting *en banc* during Term; and, to enable a function to be exercised otherwise than by the Court so sitting, the words "or a Judge" were added. This theory and expression appear to be obsolete. In these rules I have conferred all power upon the Court, and have by a general rule defined how the powers of the Court are to be exercised, i.e., by a single Judge sitting in Court, save in certain cases where that power may be exercised by a Judge in Chambers, Local Judge, or the Master in Chambers.

The former rules contained many detailed provisions concerning the officers of the court and the discharge of their duty. These seem unnecessary; and it was thought better to leave these details to be worked out by Orders in Council dealing with the appointment of officers and their duties, and by directions from the Judges and the Inspector of Legal Offices.

In addition to many minor changes embodied in the revision; in the interest of simplicity and uniformity some changes of importance are suggested; and to these attention is respectfully drawn.

One of the greatest problems in the framing of rules of practice is to devise a system which will at the same time afford a simple and speedy mode of enforcing admitted or undisputed rights, and yet be sufficiently elaborate and elastic to be adequate to the working out of important disputes and the adjustment of intricate and complicated matters. To this end it is essential that there should be at the threshold some means of separating cases in which there is a real dispute from cases in which there is no real dispute, but an attempt to abuse the practice by the setting up of some pretended defence. At one time our Courts were congested with actions upon notes, bills of exchange, and mercantile accounts, where there was no real question as to the liability of the defendants, but which were defended, and had to be taken to trial before judgment could be obtained. At that time, with a population of less than one-tenth of that at the present day, the Assize lists were longer than now.

Examinations under the Common Law Procedure Act, which enable a defence admittedly untrue to be struck out, afforded a partial remedy. Since the Judicature



Act a motion for judgment after appearance, which calls upon the defendant to disclose his defence upon oath, has proved yet more efficacious; but even in this there is much waste and delay. The decisions have established the plainly just principle that summary judgment can only be granted where there is no issue to try; hence, judgment cannot be granted where there is a conflict of evidence, and the result of the motion depends solely upon the defendant's affidavit. Where the defendant makes an affidavit disclosing any defence there is no doubt as to the result of the motion, and it becomes a purely formal matter.

These rules provide for the elimination of the plaintiff's affidavit and of the formal notice of motion to be served after appearance, and substitute a special form of writ, calling upon the defendant, where the writ is especially endorsed, to at once file an affidavit showing the nature of his defence. The plaintiff is then given the option of treating the affidavit so filed as constituting the statement of defence to his claim endorsed upon the writ and of entering the action for trial without formal pleadings. Three weeks notice of trial is required in this case, so as to afford opportunity for discovery and preparation for trial. The plaintiff may, at his election, cross-examine the defendant upon the affidavit, and if the plaintiff thinks fit he may move for judgment upon such cross-examination. He thus makes his motion for judgment after he has an opportunity of considering whether it is likely to succeed.

Wherever a writ is specially endorsed, the special endorsement will stand as the statement of claim, and the defendant must file his defence in the usual time after appearance.

While these provisions, it is hoped, will be found sufficient to prevent vexatious defences, it has been difficult to devise any entirely satisfactory remedy for vexatious actions. The temptation to bring an action without sufficient cause is not so great as the temptation to defend without reason. Under certain statutory provisions, security for costs may be ordered in classes of actions in which unfounded suits are more prevalent, e.g., libel actions, and actions against public officers.

The classes of cases in which security can be ordered have been somewhat enlarged. Where on the plaintiff's examination his case appears to be frivolous, power is given to order security; and a similar provision has been made where a worthless plaintiff has been chosen to prosecute a class action really in the interest of others. He is not a nominal plaintiff under the present decisions, as he is asserting his own right as a member of the class. Farther than as suggested in the rules relating to security it is not safe to go.

Another change is the abolition of the Order to Produce. An affidavit on production is directed to be filed ten days after the time for defence. For many years an order to examine was considered necessary. Its abolition has produced no inconvenience while reducing expense. This change is upon the same line.

Petitions are abolished. All actions are to be instituted by writ; all other proceedings by originating notice; all interlocutory proceedings by a notice of motion.

The scope of originating notices has been much enlarged. Under the present rules this procedure is confined to questions arising in the administration of an estate. In the new rules it is made to apply to the determination of any question upon the construction of a will or document, and is also made to afford means for determining in a summary way any question arising between parties when there is no question of fact in issue.



Provision is made for determining any question under the Vendors and Purchasers Act upon originating notice, and for giving notice to any person having a claim or suggested claim giving rise to the difficulty, so that the decision may be binding upon him as well as upon the vendor and purchaser.

Provision is also made that any question which would arise upon a quieting titles application may be determined in a summary way. Frequently titles have to be quieted where there is only one matter which really requires determination.

A provision has been adopted from the English Partnership Act relating to realization upon the share of a partner against whom a judgment has been recovered.

Some of the provisions found in the former rules have been omitted because they are now to be found in particular statutes; e.g., rules relating to bailable proceedings and absconding debtors, rules relating to solicitor and client taxation, and to *quo warranto*.

The result of all this has been to reduce the total number of rules to little more than half the number of existing rules.

The summons for directions which has been adopted in the English practice has not commended itself to me. In practice in England it appears not to have accomplished that which was hoped from it. No doubt if counsel of ability, familiar with the details of the particular case, appear before an experienced Judge and discuss the procedure in the particular case, the result ought to be satisfactory; but the actual result is far otherwise when the factors are different; and in practice it has been found that in most instances a stereotyped form of order is used, which follows the general provisions found in the rules.

In a contributed article in the *Law Times* (133 L.T. 565), it is said: "The compulsory summons for directions, from which certain Judges hoped for so much, has proved very ineffective, and is deemed by all barristers in large practice with whom I have discussed it to perform the same functions as the fifth wheel of a coach. One has only to read the orders made on these summonses to see that they are all of a stereotyped character and in the majority of cases wholly unnecessary." The editorial comment on this is: "It is difficult to see what useful purpose the summons for directions has served, and in the vast majority of cases it is wholly unnecessary."

In these rules provision is made for the directing of a speedy trial upon an injunction motion, and to permit a motion for judgment in mercantile cases immediately upon the issue of the writ. Attention is also drawn to Rules 142, 145 and 156 relating to pleading.

The tariff of costs has been the occasion of much thought. I have been assisted in framing a new tariff by committees of the Ontario Bar Association and the County of York Law Association. As the new tariff of solicitor's fees departs widely from the tariff now in use, it may be well to give at length the reasons for recommending it.

Two leading ideas must be kept in mind. As has often been said, natural justice demands that in ordinary cases the losing party should pay the costs; not upon the principle that "to the victor belongs the spoils"—for costs are not to be regarded as spoils, but as an indemnity to the successful party who has been compelled to resort to the courts to obtain his rights.

The second is that in cases in which costs are awarded the amount actually given should be as nearly as practicable an indemnity for the cost necessarily

incurred. If costs taxed do not amount to the sum which the successful party must pay his solicitor, to that extent the purpose fails for which the costs are given: "that he may be indemnified for the costs occasioned by his unjust vexation."

At the same time, such safeguards must surround the taxation of costs as to avoid costs being made an instrument of oppression. The temptation is ever present, not only to the solicitor but to the client, to incur costs in the hope that the opponent will in the end have to pay. This sometimes is from malice or greed: more often with the idea that the client's interest will be served by making it plain that litigation can be made so burdensome that an opponent had better accept any compromise offered.

The proposition has been repeatedly made that in the interest of the public and the solicitor the costs of litigation should be definitely fixed and ascertained, so that the parties might know in advance exactly how much is risked in litigation. The experiment has been tried by limiting the amount to be awarded as party and party costs, and has been found to be a failure. The solicitor for the successful party must be paid for the services actually rendered: and his opponent, knowing this and knowing that he incurs no additional risk, deliberately sets himself to increase the burden of the excess of solicitor and client costs over and above the party and party costs that can be awarded. Similarly, when the costs of an appeal have been fixed at a sum not adequate to indemnify, some litigants appeal every case, so as to discourage litigation with them; the verdict being sadly cut into by the excess costs. It must not be forgotten that litigation is war, that large corporations have much litigation, and that some frame their policy in dealing with litigants in such a way as to make litigation so full of terror, by reason of expense and delay, as to bring about the settlement of the majority of claims at much smaller sums than the claimants are really entitled to receive.

When any so-called "block tariff" is devised, if it is not to be in itself burdensome it must be based upon the actual costs of litigation conducted on economical lines. Then it becomes an easy matter, when the extra expense has to be borne by the opponent, to make the actual cost exceed the amount fixed. In some jurisdictions where the experiment has been tried, this defect became very plain, and a remedy was sought in a provision giving the Judge power to award a lump sum in addition to the fixed fee. This was a complete abandonment of the principle of certainty upon which the block tariff was based, besides introducing in its worst form the evils of the personal equation. When the amount allowed for costs is discretionary, there are as many different standards as there are Judges, and chaos reigns. It was found that Mr. Justice A. said: "You are lucky to have a verdict, and should not ask for extra costs from the unfortunate defendant", whilst Mr. Justice B. would have said in the same case, "it is a close case, won by the skill of your advocate, and I shall give you a handsome increased fee."

Another objection to a block tariff is that the same allowance must be made for a case that is very simple, and for a case that is of necessity long and complicated. The doctrine of averages might be applied if all litigation were between the same litigants instead of between different parties; but there is no justice in making A. pay, in his litigation with B., part of the costs in a suit between X. and Y.

In the tariff here proposed, a modified form of block tariff has been adopted, giving a lump sum from stage to stage of the action; some of the allowances being made subject to increase in the discretion of the taxing officer or Judge.

Regarded as a grouping of items now charged separately, this seems to be defensible; and an endeavour has been made to secure uniformity in the exercise of the discretion given, by providing, as now, that most of the increased fees are to be in the discretion of the taxing officers at Toronto. Where discretion has been given to local officers it was found that individual discretion varied to an extraordinary degree. Only by reference to some central authority can any uniformity be secured.

The adoption of this system will do away with the present itemized bill, and it is believed will meet with acceptance, as there is no encouragement given for unnecessary and useless proceedings.

Yours faithfully,  
W. E. MIDDLETON.

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## APPENDIX "M"

## MEMO. OF FEES

No.....

## In the Surrogate Court of the County of York

In the Estate of ..... DECEASED  
 UPON READING THE APPLICATION OF.....

the affidavits and papers filed in support thereof, and the Report of the Registrar thereon,  
 I do order that Letters.....  
 issue to the Applicant.

\* S. C. .... Dated at Chambers this ..... day }  
 S. T. .... of ..... }  
 P. T. .... A.D. 191 ..... } Surrogate Judge.

## Memorandum of Crown Fees, and Fees payable to Judge and Registrar.

Proceedings.	Fees of		In
	Registrar.	Judge.	Stamps.
	\$ c.	\$ c.	\$ c.
1. For services rendered under Sec. 73, ss. 1, of Surrogate Courts Act, where value of property does not exceed \$400 .....	1 50	50	30
2. Receiving and examining papers and entering application...	1 00	.....	50
3. Notice to Surrogate Clerk.....	25	.....	.....
4. Return of grant to Surrogate Clerk .....	25	.....	.....
5. Certificate of Surrogate Clerk.....	.....	.....	50
6. Receiving and entering same .....	25	.....	.....
7. Recording Bond, with affidavits of justification and execution.	1 00	.....	.....
8. Recording additional separate affidavits of ditto ..... fol., 10c. per fol. ....	.....	.....	.....
9. Fiat on Bond.....	.....	50	.....
10. Grant—Value of Personal Property under \$. .... { Per. \$. .... Real. \$. ....	.....	.....	.....
11. Attendance to grant Probate or Letters of Administration..	.....	1 00	.....
12. Submitting Papers with Registrar's Report thereon to lead grant.....	50	.....	.....
13. Preparing Probate or Letters of Administration issued under Seal of Court.....	75	.....	50
14. Preparing Letters of Guardianship issued under Seal of Court.	.....	.....	.....
15. Certificate of Search for Will (Administration applications only) .....	50	.....	.....
16. Recording Grant or other Instrument or Letters of Guardianship (including Will in case of Probate or Administration with will annexed)..... fol. .... 10c. per fol. ....	.....	.....	.....
17. Transcript of Will (attached to Grant).... fol. .... 10c. per fol. ....	.....	.....	.....
18. Certified Copy of Will for Surrogate Clerk ... fol. .... 10c. per fol. ....	.....	.....	.....
19. Attending and entering every Order or Minute .....	50	50	.....
20. Taking every affidavit and administering oath to witness .....	.....	.....	.....
21. Drawing Special Order or other papers directed by Judge.....	.....	.....	.....
22. Writing necessary letters .....	25 cents each	.....	.....
23. Services under Succession Duty Act; Receiving and examining Affidavits and Schedules and entering application .....	1 00	.....	.....
Notice to Provincial Treasurer.....	25	.....	.....
Notice to Solicitor to Treasury.....	25	.....	.....
Receiving and entering Consent of Solicitor to Treasury.....	25	.....	.....
24. Filings (including those under Succession Duty Act)..... ..... 10 cents each .....	.....	.....	.....
25. ....	.....	.....	.....
26. Postages.....	.....	.....	.....
	\$ .....	.....	.....

Place Stamps here and on back.

Judge ..... \$.....  
 In Stamps.....  
 Registrar .....

\$

\* Date when notice of application mailed to Surrogate Clerk, Succession Duty affidavit mailed to Solicitor to Treasury, Notice sent to Provincial Treasurer.



## APPENDIX "N."

## SHERIFFS.

GEORGE CALDBICK, of the Town of Cobalt, in the Provisional Judicial District of Temiskaming, Esquire, to be Sheriff in and for the said Provisional Judicial District of Temiskaming.—*Gazette, 17th May.*

HENRY ENDACOTT, of the Town of Orangeville, in the County of Dufferin, Esquire, to be Sheriff in and for the said County of Dufferin, in the room and stead of Thomas Bowles, Esquire, deceased.—*Gazette, 23rd August.*

ALEXANDER McCOWAN, of the City of Toronto, in the County of York, Esquire, to be Sheriff in and for the County of York, in the room and stead of F. D. Daville, Esquire, deceased.—*Gazette, 13th September.*

## SURROGATE COURT JUDGES.

HIS HONOUR JOHN O'DONNELL, DRUMGOLE, Senior Judge of the County of Essex, to be Judge of the Surrogate Court of the said County of Essex, in the room and stead of His Honour Judge McHugh, deceased.—*Gazette, 2nd August.*

HIS HONOUR LORNE BRUCE CHADWICK LIVINGSTONE, of the Town of Welland, in the County of Welland, Judge of the County Court of the said County of Welland, to be Judge of the Surrogate Court of the said County.—*Gazette, 8th November.*

HIS HONOUR G. N. VANCE, Senior Judge of the County of Simcoe, to be Judge of the Surrogate Court of the said County of Simcoe, in the room and stead of His Honour Judge Ardagh, resigned.—*Gazette, 8th November.*

## LOCAL MASTERS.

HIS HONOUR H. HARTMAN, Judge of the Provisional Judicial District of Temiskaming, to be Local Master of the Supreme Court of Ontario, in and for the said District of Temiskaming.

## LOCAL REGISTRARS, SURROGATE REGISTRARS, ETC.

THOMAS J. MEAGHER, of the Town of Haileybury, in the Provisional Judicial District of Temiskaming, Esquire, to be Clerk of the District Court and Registrar of the Surrogate Court in and for the said Provisional Judicial District of Temiskaming.—*Gazette, 17th May.*

## COUNTY CROWN ATTORNEYS AND CLERKS OF THE PEACE.

FRANK L. SMILEY, of the Town of New Liskeard, in the Provisional Judicial District of Temiskaming, Esquire, Barrister-at-law, to be District Crown Attorney and Clerk of the Peace in and for the said Provisional Judicial District of Temiskaming.—*Gazette, 17th May.*

ARCHIBALD HENRY MACDONALD, of the City of Guelph, in the County of Wellington, to be Crown Attorney and Clerk of the Peace in and for the said County of Wellington, in the room and stead of H. W. Petterson, Esquire, resigned.—*Gazette, 28th June.*

FREDERICK JOHN STRANGE MARTIN, of the City of Sault Ste. Marie, in the District of Algoma, Barrister-at-Law, to be District Crown Attorney and Clerk of the Peace in and for the said District of Algoma, in the room and stead of Moses McFadden, Esquire, resigned.—*Gazette, 9th August.*

RICHARD HENRY HUBBS, of the Town of Picton, in the County of Prince Edward, Esquire, Barrister-at-Law, to be Crown Attorney and Clerk of the Peace in and for the said County of Prince Edward, in the room and stead of James Roland Brown, Esquire, deceased.—*Gazette, 27th September.*

#### POLICE MAGISTRATES.

WALTER E. KELLY, of the Town of Goderich, in the County of Huron, Esquire, to be Police Magistrate in and for the said Town of Goderich, in the room and stead of John Butler, Esquire, removed.—*Gazette, 11th January.*

ANGUS McDONNELL KEVILL, of the Town of Amherstburg, in the County of Essex, Esquire, to be Police Magistrate in and for the said Town of Amherstburg.—*Gazette, 25th January.*

JAMES L. LOUGHEAD, of the Village of Lion's Head, in the County of Bruce, Esquire, to be Police Magistrate in and for the said Village of Lion's Head.—*Gazette, 25th January.*

W. J. WATSON, of the Town of Oshawa, in the County of Ontario, to be Police Magistrate in and for the said Town of Oshawa, in the room and stead of L. K. Murton, Esquire, deceased.—*Gazette, 1st March.*

EDWIN JAMES BRISTOW, of the Village of Bright, in the County of Oxford, Esquire, to be Police Magistrate in and for the said Village of Bright, in the said County of Oxford.—*Gazette, 22nd March.*

EDMOND JEREMIAH O'CALLAGHAN, of the Village of Arthur, in the County of Wellington, Esquire, to be Police Magistrate in and for the said Village of Arthur, in the room and stead of George Hudson, Esquire, deceased.—*Gazette, 19th April.*

THOMAS FENNELL, of the Village of Dundalk, in the County of Grey, Esquire, to be Police Magistrate in and for the said Village, in the room and stead of Peter McGregor, Esquire, who has removed from the locality.—*Gazette, 10th May.*

FREDERICK WATT, of the City of Guelph, in the County of Wellington, Esquire, Barrister-at-Law, to be Police Magistrate, on and from the first day of June, 1913, in and for the said City of Guelph, in the room and stead of Thomas Wilcocks Saunders, Esquire, resigned.—*Gazette, 17th May.*

MORLEY F. PUMAVILLE, of the Town of New Liskeard, in the Provisional Judicial District of Temiskaming, Esquire, Barrister-at-Law, to be Police Magistrate in and for the said Provisional Judicial District of Temiskaming, in the room and stead of H. Hartman, resigned.—*Gazette, 24th May.*

DANIEL CHISHOLM MCKENZIE, of the Township of Ekfrid, in the County of Middlesex, Esquire, Strathburn P.O., to be Police Magistrate in and for the Electoral District of West Middlesex.—*Gazette, 7th June.*

JAMES N. LAGROIS, of the Town of Rockland, in the County of Russell, Esquire, to be Police Magistrate in and for the Township of Clarence, in the said County of Russell.—*Gazette, 28th June.*

ROBERT FRASER, of the Village of Russell, in the County of Russell, to be Police Magistrate in and for the said Village of Russell, and in and for the Townships of Russell and Cumberland, in the said County of Russell.—*Gazette, 9th August.*

J. C. McMILLAN, of the Town of Webbwood, in the District of Sudbury, Esquire, to be Police Magistrate in and for the said Town of Webbwood, and in and for the territory composed of the Townships of Lewis, Shedden, Victoria, Salter, May, Gough, Shakespeare, Hallam, Harrow, McKinnon, Merritt, Baldwin, Nairn, Foster and Lorne.—*Gazette, 16th August.*

ALEXANDER M. HAMILTON, of the Village of Warkworth, in the County of Northumberland, one of the United Counties of Northumberland and Durham, to be Police Magistrate in and for the said Village of Warkworth and in and for the Township of Percy.—*Gazette, 16th August.*

HOWARD GOVER, of the Village of Coldwater, in the County of Simcoe, Esquire, to be Police Magistrate in and for the said Village of Coldwater.—*Gazette, 23rd August.*

HORACE FALCONER JELL, of the City of St. Thomas, in the County of Elgin, Esquire, Barrister-at-Law, to be Police Magistrate in and for the said City of St. Thomas, in the room and stead of J. M. Glenn, Esquire, deceased.—*Gazette, 13th September.*

AMOS CHARLES VAUGHAN, of Superior Junction, Esquire, Police Magistrate in and for the Provisional Judicial District of Kenora, to be Police Magistrate for that portion of the Province of Ontario known as the District of Patricia.—*Gazette, 13th September.*

ALLAN GRIERSON, of the Town of Arnprior, in the County of Renfrew, Esquire, to be Police Magistrate in and for the said Town of Arnprior, in the room and stead of Arthur Burwash, Esquire, resigned.—*Gazette, 27th September.*

GEORGE DREWRY, of the Village of Brighton, in the County of Northumberland, Esquire, Barrister-at-Law, to be Police Magistrate in and for the said Village of Brighton and in and for the Townships of Brighton and Murray.—*Gazette, 27th September.*

JOHN COUTTS, of the Village of Thamesville, in the County of Kent, Esquire, Barrister-at-Law, to be Police Magistrate in and for the said Village of Thamesville.—*Gazette, 11th October.*

NEIL COLVILLE, of the Village of Orono, in the County of Durham, Esquire, M.D., to be Police Magistrate in and for the said Village of Orono.—*Gazette, 11th October.*

WILLIAM STEWART, Pelee Island P.O., in the County of Essex, Esquire, to be Police Magistrate in and for the Township of Pelee Island.—*Gazette, 15th November.*

HAROLD CALLWOOD, of the Town of Tilbury, in the County of Kent, Esquire, Police Magistrate, in and for the said Town of Tilbury and the Townships of Tilbury East and Romney, to be Police Magistrate in and for the Township of Tilbury North.—*Gazette, 13th December.*

#### ASSOCIATE CORONERS.

JAMES ROBERT GIBSON, of the City of Toronto, in the County of York, Esquire, M.D., to be an Associate Coroner in and for the said County of York.—*Gazette, 11th January.*

JAMES ROBERT GIBSON, of the City of Toronto, in the County of York, Esquire, M.D., to be an Associate Coroner in and for the said County of York.—*Gazette, 25th January.*



WELLINGTON C. JEFFERS, of the Town of Lindsay, in the County of Victoria, Esquire, M.D., to be an Associate Coroner in and for the said County of Victoria.—*Gazette, 1st February.*

ROBERT E. WODEHOUSE, of the City of Fort William, in the District of Thunder Bay, Esquire, M.D., to be an Associate Coroner in and for the said District of Thunder Bay and for the Districts of Rainy River, Kenora, Algoma and Manitoulin.—*Gazette, 8th February.*

JOHN N. NETTLETON, of the Village of Port Stanley, in the County of Elgin, Esquire, M.B., to be an Associate Coroner in and for the said County of Elgin.—*Gazette, 8th February.*

NICHOLAS NORMAN BLANCHARD, of the Village of Sunderland, in the County of Ontario, Esquire, M.B., to be an Associate Coroner in and for the said County of Ontario.—*Gazette, 15th February.*

W. EGERTON GEORGE, of the Town of North Bay, in the District of Nipissing, Esquire, M.D., to be an Associate Coroner in and for the said District of Nipissing and for the Districts of Parry Sound, Temiskaming and Sudbury.—*Gazette, 15th February.*

ERNEST DIXON CALVERT, of the Town of Rainy River, in the District of Rainy River, to be an Associate Coroner in and for the said District of Rainy River.—*Gazette, 1st March.*

CHESTER JACKSON MCBRIDE, of the Town of Welland, in the County of Welland, Esquire, M.D., to be an Associate Coroner in and for the said County of Welland.—*Gazette, 1st March.*

DAVID ALEXANDER HOPPER, of the Village of Waterdown, in the County of Wentworth, Esquire, M.D., to be an Associate Coroner in and for the said County of Wentworth.—*Gazette, 8th March.*

JOHN ALEXANDER RANNIE, of the Town of Chesley, in the County of Bruce, Esquire, M.D., to be an Associate Coroner in and for the said County of Bruce.—*Gazette, 26th April.*

WILLIAM ANDERSON MCCAULEY, of the Town of Copper Cliff, in the District of Sudbury, Esquire, M.D., to be an Associate Coroner in and for the said District of Sudbury.—*Gazette, 26th April.*

JAMES A. BAKER, of the Town of Gore Bay, in the District of Manitoulin, Esquire, M.D., to be an Associate Coroner in and for the said District of Manitoulin.—*Gazette, 3rd May.*

WELLINGTON C. JEFFERS, of the Town of Lindsay, in the County of Victoria, Esquire, M.D., to be an Associate Coroner in and for the said County of Victoria.—*Gazette, 3rd May.*

FRANKLIN S. YOUNG, of Seeley's Bay P.O., in the County of Leeds, Esquire, M.D., to be an Associate Coroner in and for the United Counties of Leeds and Grenville, and for the Townships of Storrington and Pittsburg in the County of Frontenac.—*Gazette, 10th May.*

HOWARD MACLAREN RAPHAEL, of the Village of Cainsville, in the County of Brant, Esquire, M.D., to be an Associate Coroner in and for the County of Brant.—*Gazette, 17th May.*

JAMES R. NIXON, of the Village of Georgetown, in the County of Halton, Esquire, M.D., to be an Associate Coroner in and for the County of Halton.—*Gazette, 17th May.*



WILLIAM H. WADDELL, of the Township of Augusta (North Augusta P.O.), in the County of Grenville, Esquire, M.D., to be an Associate Coroner in and for the United Counties of Leeds and Grenville.—*Gazette, 24th May.*

WILLIAM JAMES GEDDES, of the Village of Arden, in the County of Frontenac, Esquire, M.D., to be an Associate Coroner in and for the said County of Frontenac.—*Gazette, 7th June.*

THOMAS STODDART, of the Town of Copper Cliff, in the District of Sudbury, Esquire, to be Police Magistrate in and for the Townships of Creighton, Snider and McKim, in the said District of Sudbury.—*Gazette, 14th June.*

JAMES D. MACDONALD, of the Town of Huntsville, in the District of Muskoka, Esquire, M.D., to be an Associate Coroner in and for the said District of Muskoka.—*Gazette, 28th June.*

FREDERICK JAMES SNELGROVE, of the City of Toronto, in the County of York, Esquire, M.D., to be an Associate Coroner in and for the said City of Toronto.—*Gazette, 28th June.*

ROBERT SHEARD, of the City of Toronto, in the County of York, Esquire, M.D., to be an Associate Coroner in and for the said City of Toronto.—*Gazette, 19th July.*

HERBERT W. BURGESS, of the City of Toronto, in the County of York, Esquire, M.D., to be an Associate Coroner in and for the said City of Toronto.—*Gazette, 26th July.*

ARCHIBALD VALANCEY BECHER, of the City of London, in the County of Middlesex, Esquire, M.D., to be a Coroner in and for the said County of Middlesex, including the City of London.—*Gazette, 13th September.*

FREDERICK HENRY KALBFLEISCH, of the City of Berlin in the County of Waterloo, Esquire, M.D., to be an Associate Coroner in and for the said County of Waterloo.—*Gazette, 13th September.*

DONALD MCLEOD, of the City of Toronto, in the County of York, Esquire, M.D., to be an Associate Coroner in and for the said City of Toronto.—*Gazette, 13th September.*

W. MORLEY WILKINSON, of the Village of Palermo, in the County of Halton, Esq., M.D., to be an Associate Coroner in and for the said County of Halton.—*Gazette, 13th September.*

RANDAL YOUNG KENNY, of the City of Toronto, in the County of York, Esquire, M.B., L.R.C.P., M.R.C.S., to be an Associate Coroner in and for the City of Toronto.—*Gazette, 1st November.*

JOHN FERGUSON, of the Town of Kincardine, in the County of Bruce, Esquire, M.D., to be an Associate Coroner in and for the said County of Bruce.—*Gazette, 22nd November.*

WALTER WODEHOUSE GEIKIE, of the Village of Elmira, in the County of Waterloo, Esquire, M.D., to be an Associate Coroner in and for the said County of Waterloo.—*Gazette, 22nd November.*

CHARLES ALEXANDER McLAUGHLIN THRUSH, of the Town of Dunnville, in the County of Haldimand, to be an Associate Coroner in and for the said County of Haldimand.—*Gazette, 29th November.*









# ANNUAL REPORT

OF THE

# Inspector of Registry Offices

FOR THE

PROVINCE OF ONTARIO

1913

PRINTED BY ORDER OF  
THE LEGISLATIVE ASSEMBLY OF ONTARIO



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*To His Honour* SIR JOHN MORISON GIBSON, K.C.M.G., etc., etc., etc.,

*Lieutenant-Governor of the Province of Ontario.*

MAY IT PLEASE YOUR HONOUR:

The undersigned begs respectfully to present to Your Honour the annual report of the Inspector of Registry Offices for the year 1913.

J. J. FOY,

*Attorney-General.*

Toronto, April, 1914.





REPORT  
OF THE  
INSPECTOR OF REGISTRY OFFICES  
FOR THE YEAR 1913

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GUELPH, 10th March, 1914.

TO THE HONOURABLE J. J. FOY, K.C.,

*Attorney-General of the Province of Ontario.*

SIR.—I now beg to present my Report as Inspector of Registry Offices for the past year.

The number of instruments registered and the aggregate amount of fees received by Registrars in 1913 were as follows:

The number of instruments registered in 1913 is 241,280 or fewer by 1.117 than in the year 1912.

The comparative returns regarding fees are as follows:

1913 Gross fees . . . . .	\$375,675.23
Net fees . . . . .	140,347.38
1912 Gross fees . . . . .	380,115.99
Net fees . . . . .	144,297.13

showing slight decreases in fees, both gross and net.

The tabulated statement of returns of the Registrars for the year 1913 appears as an appendix to my Report.

The differences between Registrars and Solicitors and others touching the registration of instruments and as to fees, have not been more numerous than those which I have had to decide or dispose of in former years, and in no case has the difference or dispute involved a charge against any Registrar of wilful misconduct or of inefficiency. There always have been, and I believe always will be, new questions arising in connection with the transaction of the very onerous duties of Registrars, in respect to which there is room for honest differences of opinion, as to the state of the law applicable to or bearing on the subject of difference, including the interpretation and application of the provisions of the Registry and other relevant Acts; but even on questions of law referred to me, I have found that the Registrars, most of whom are not lawyers, have presented their views so clearly and cogently as to have been of real help to me in arriving at my decisions.

I have much pleasure in saying that I believe the Registrars generally and their assistants, perform their official duties in an intelligent, painstaking and efficient manner and to the satisfaction of persons who transact business in their offices.

Accompanying this Report are notes of some of the decisions and opinions which I have given on various questions which have arisen for my consideration since those published in my last Report.

By section 479 of the Municipal Act, 1913, an important change was made in the law with regard to the laying out of highways. That clause provides that no Municipal Council or owner of land shall lay out any highway less than 66 feet in width, or except in the case of a city or town more than 100 feet in width. On references to me I have given opinions to the effect that reading this section and subsection 14 of section 80 of the Registry Act together, a Registrar cannot now, even with the consent of the proper Municipal Council, register a plan of subdivision, which lays out any highway less than 66 feet in width.

I respectfully recommend that for the removal of doubts the Registry Act be amended so as to expressly provide that a Certificate of Discharge of Mortgage executed by the person entitled by law to receive the mortgage money shall, when registered, be a valid discharge of the mortgage or of the lands in case it is a partial Discharge, and shall have the same effect as a Release of the Mortgage or a re-conveyance to the Mortgagor, his heirs or assigns, etc. In two classes of cases questions not infrequently arise under the present state of the law, as follows:

(a) In the case of a mortgage to a deceased mortgagee who has appointed two or more executors of his Will, should a Discharge of the Mortgage be executed by all the executors, or may one executor execute a valid Discharge, having the effect of a release of the mortgage and a reconveyance of the estate? I have given an opinion that as one executor is entitled to collect and receive the mortgage debt he is under the Devolution of Estates Act, section 8, empowered to give an effectual Discharge of the Mortgage, which will operate as a release and re-conveyance; but some doubt appears to exist on the point which should, I think, be cleared up.

(b) Where a Mortgage is made to two or more persons jointly, and not in shares, the question has arisen as to whether a Discharge by the survivors of such persons or the personal representative of the last survivor will work a valid release and re-conveyance of the mortgage premises. Under section 4 of the Mercantile Law Amendment Act it appears to me that with regard to mortgages made after 1st July, 1886, the last survivor of such mortgagees, or the personal representative of the last survivor of such mortgagees, may give a valid receipt which shall be a complete discharge of or for the money secured by the mortgage; and in my opinion such a receipt in the form of a certificate of payment of the mortgage would, under the Registry Act, operate as a Release and reconveyance of the mortgaged premises; but I submit it is expedient that all doubt on such an important point should be set at rest by an amendment to the Registry Act.

I suggest also for your consideration and approval and that of the Legislature a further amendment to the Registry Act, namely, an amendment of subsection 16 of section 80, so as to provide that the word "owner" in that subsection shall include a lessee under a registered lease and which appears to be for a term still unexpired, say of 10 years or more, and that the word "mortgagee" in that subsection shall include a mortgagee of such leaseholder's interest. A Lessee under a long lease has an interest in the nature of a permanent interest in the land, and therefore his consent to the registration of a plan subdividing the land in which

he has such interest, should be required to be given as a preliminary to registration of a plan. I have had cases before me where leases for 99 years were registered and mortgages of the leaseholder's interests have been recorded, and yet it has been contended that plans can be made subdividing the leasehold premises or affecting them, without the consent of the lessees or mortgagees under them because such Lessees were not "owners" within the meaning of the section of the Act referred to.

I have the honour to be, Sir,

Your obedient servant,

DON. GUTHRIE,

*Inspector of Registry Offices.*

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MEMORANDUM.

Since the foregoing Report was presented the Legislature has repealed Section 479 of the Municipal Act above referred to, and substituted other provisions therefor.

NOTES OF DECISIONS AND OPINIONS OF DONALD GUTHRIE, K.C.,  
INSPECTOR OF REGISTRY OFFICES.

1. A REGISTRAR IS ENTITLED TO CHARGE FOR A PROPERLY CERTIFIED COPY OF AN INSTRUMENT WHETHER HE MAKES SUCH COPY HIMSELF OR WHETHER SUCH COPY IS MADE BY ANOTHER PROVIDED HE HAS BEEN REQUESTED TO FURNISH SUCH CERTIFIED COPY. OBSERVATIONS REGARDING COPIES OF ORDERS FOR MACHINERY.

A difference has come before me for decision which has arisen between the A. Company and the Registrar of X. The circumstances are as follows:

On the 22nd October the Company sent to the Registrar one of their orders for machinery executed by one G. B., creating a charge upon his land and containing many of the provisions usual in such instruments. The letter requested the Registrar to make a memo. (not a certificate) on the copy of the order which they forwarded with the original. "that the same (registration) had been done giving the date, time, etc." and they asked that the copy be returned to them. They enclosed \$1.25. The order was endorsed not to be recorded in full. I presume that \$1.00 was for registering the order and the twenty-five cents was for the certificate or memo.

On the 23rd the Registrar acknowledged the Company's letter of the 22nd, and stated that he had received the agreement enclosed, which he had duly registered. Regarding the copy he said it would cost them about "\$3.00 for certificate or memo. without the fee of \$1.00 for registration," and he asked the Company to let him know if he would send certificate as above.

The Company replied to the Registrar's letter stating amongst other things, that the memo. of registration that they required on the copy sent by them to him was as follows:

"I certify that the original of the within Instrument is duly entered and registered in the Registry Office for the Registry Division of the County of \_\_\_\_\_ in book \_\_\_\_\_ for \_\_\_\_\_ at \_\_\_\_\_ o'clock m., of the day of A.D. 1913,"

They asked the Registrar to enter this memorandum on the copy with particulars of registration and return it to them. In reply the Registrar said that he quite understood the form of certificate the Company had mentioned in their letter of 24th; he stated that was the proper certificate to put on a duplicate, but he goes on to say that a duplicate and a copy are different, and that his fees for a copy are the same as if he had made a copy. He further said that if the Company had sent the duplicate he would have put the certificate on it as they required, but that a copy requires a different certificate. In their next letter to the Registrar dated 27th October, the Company say that all other Registrars in Ontario return copies with memo. of registration such as they had requested of him, and they say as follows: "Shall we refer to the referee at Guelph, or will you return copy of order completed." Further correspondence between the parties has resulted in a reference to me. The Certificate which the Registrar made upon the copy of the instrument is as follows: "I certify that the within is a true and correct copy of an instrument duly entered and registered in the Registry Office for the County of X., etc." and the date of the Certificate is 1st November, 1913. That Certificate is under the Registrar's hand but is not under his official seal.



Certified copies of instruments are provided for in the following sections of the Registry and Evidence Acts. Section 22, subsection 1, Registry Act, provides that on the *request* of any person, the registrar shall furnish a certified copy under his *hand and seal of office* of any instrument registered in his office. The Evidence Act, section 46, provides amongst other things, that a copy of an instrument certified under the hand and seal of office of the Registrar to be a true copy shall be prima facie evidence of the original, etc. The certificate on a certified copy has to be signed by the Registrar under his seal of office, section 47. Then section 44 of the Registry Act, subsection 1, provides that where an instrument is registered, the Registrar shall deliver a certified copy or copies thereof as may be required of him, and of all documents connected with or relating to the same under his signature and seal of office, etc.

I gave an opinion which is reported in my Report for 1895, page 17, in a case where the Solicitor had brought a typewritten copy of an instrument to the Registrar and had requested the Registrar to certify to it as a true copy. In that case I decided that the Registrar had the right to charge for the copy, whether he himself had the copy made or it was made by the Solicitor and compared and certified by the Registrar. It does not appear to me in this case that the Company made a request for a certified copy of the Order. What they required was a certificate or memorandum of the particulars of registration of the original instrument. I infer that their object was to show that the original was registered and to have in their possession such particulars as would enable them to give a proper Discharge of their lien, when the same should be satisfied.

See my Report for 1896, page 8, where a Company sought a Certificate to the same effect as the Company here. In that case I suggested that such a Certificate as the Company had required in this case, might be given, stating that the copy purports to be a true copy, but after the word "copy" there might be inserted in the Certificate some such words as the following "but not hereby certified to be a true copy." Some Registrars limit the certificate on such copies by stating that "I certify that the original of the within instrument of which this purports to be a copy, though uncomparred by the Registrar, is duly entered, etc." See my Report for 1912, page 16.

It is to be noted that section 19 of the present Registry Act which is based upon section 27 of the former Registry Act, R.S.O. 1897, ch. 136, leaves out the word "copies," before the word "Abstracts" in the third line so that the provisions, now to be found in the Registry Act, regarding the furnishing of certified copies are contained in section 22 or former section 28, authorizing certified copies and also section 44 above noted. Section 91 (f) provides the fees for copies of Instruments when required.

I have no doubt the Registrar made the charge in good faith. He may have inferred that the correspondence implied a request by the Company for a certified copy of the Instrument. He quotes section 22 of the Registry Act which enacts that on request of any person the Registrar shall furnish a certified copy, etc. But I think that the correspondence of the Company did not in fact amount to a request for a certified copy of the instrument; and of course, it has to be noted further as I have already mentioned, that the certified copy which was furnished was not under seal.

I think on the whole that this dispute should be decided in favor of the Company.

2. DERIVATIVE MORTGAGE. A CERTIFICATE OF DISCHARGE MAY BE GIVEN OF A MORTGAGE CREATED BY AN ASSIGNMENT OF A MORTGAGE BY WAY OF MORTGAGE. EFFECTS OF REGISTRATION OF CERTIFICATE.

To a Registrar:

In answer to the questions you submit for my opinion regarding Discharge of a derivative mortgage, I have to say as follows:

1. I think the Certificate of Discharge of Mortgage of the mortgage or in other words of the derivative mortgage may be registered under section 62 of the Registry Act: See I George V, chapter 17, section 31; and that such certificate will have the effect of revesting in the mortgagor under the derivative mortgage all his rights to the original mortgage, which he has assigned by way of mortgage.

2. The derivative mortgage contains a proviso for redemption upon payment of the \$1,200.00 and interest. The mortgage assigned was for \$3,000.00. The assignment of mortgage was only by way of security for the amount lent (\$1,200.00) by the mortgagee under the derivative mortgage and for the interest; such amounts having been paid in full, as appears by the certificate of discharge, all the right of the derivative mortgagee in the mortgage premises and in the original mortgage, and in the covenants of the original mortgage and otherwise, are at an end, and everything assigned by way of security for the \$1,200.00 ought to be revested in the mortgagor under the derivative mortgage, and will, I think, on the registration of the Certificate of Discharge of the derivative mortgage be completely revested in the mortgagor. You will in making entries in your books treat the discharge accordingly.

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3. A TAX DEED CONTAINING AN INDEFINITE OR IMPERFECT DESCRIPTION—ERRONEOUSLY OR IMPROPERLY REGISTERED AGAINST A LOT—MAY BE DISREGARDED BY THE REGISTRAR IN CONNECTION WITH THE REGISTRATION OF A PLAN OF SUBDIVISION OF THE LAND MADE FOR THE PERSON APPEARING BY THE REGISTRY BOOKS TO BE THE OWNER OF THE LAND.

My opinion has been requested in connection with the registration of a Plan of subdivision proposed to be registered by Mr. W. as owner of Ordnance Lot No. 53a in the Township of T. in the County of X. The following are the circumstances.

There was a Tax Deed in favor of one L. registered in 1875. It was entered by the then Registrar in the Abstract Index against Ordnance lots 53a and 53b. The Tax Deed purported to have been for the north, one acre of the west, 6 acres of lot 53 Ordnance Reserve. The Solicitor for Mr. W. who proposes to register the Plan of Subdivision states, and the Registrar concurs, that there is no Ordnance lot 53 in the Township of T. There are two lots 53a and 53b but not a lot 53. These lots 53a and 53b are widely separate on the Government Plan.

I think the then Registrar (in 1875) should not have entered the Tax Deed against either lots 53a and 53b. That Deed does not show to which of these two lots it refers, if to either, and should therefore have been treated as incapable of registration for uncertainty; also because it purported to affect a lot which had no existence according to the Government Plan.

I may have power and authority under clause (h) of section 111 of the Registry Act to direct the Registrar to amend or correct in the Abstract Index the entry of this Tax Deed against lots 53a and 53b; but I am not, at present at least disposed, to exercise, in the case of such an old deed, that power, without, at all events, notice to the grantee under the Tax Deed. I have, however, to observe for the purposes of the registration of the Plan by Mr. W. that I consider, in view of the facts, the Registrar is entitled to look, and should look, at the copy of the Tax Deed in the Registry, and having referred to that copy, and to the Tax Deed itself, he can, and I think should, say, for the purposes of the registration of this Plan, that that Deed does not appear or purport on the face of it, to affect any part of 53a and that it should not, therefore, stand in the way of the registration of this Plan; and I think the Registrar is entitled, for the purposes of section 80, subsection 16, to disregard, and should disregard, the entry in the Abstract Index of this Deed against lot 53a.

The Registration of this Plan will not affect the actual title to the property subdivided by it nor will it in law prejudice the title, if any, acquired by the Tax purchaser under the Tax Deed. Purchasers from Mr. W. will still be under the necessity, if they wish to obtain a satisfactory title from him, of having the title prior to the Plan investigated, and probably also of satisfying themselves, amongst other things, with regard to the validity or invalidity, or the effect of this Tax Deed.

It has been suggested that a Quit Claim Deed be obtained from the Tax Purchaser, but it is said that he is unknown, and probably, if discovered, he would exact a considerable sum of money for giving a Deed, and besides, there might be considerable delay in the search for him, and in negotiations with him, etc.; and I consider it is unnecessary in connection with the registration of the Plan to put Mr. W. to this trouble and possible expense and delay.

4. A DISCHARGE OF MORTGAGE EXECUTED BY AN ASSIGNEE OF THE MORTGAGE AND MORTGAGE MONEY AND INTEREST MAY BE REGISTERED ALTHOUGH THE ASSIGNMENT OF MORTGAGE OMITS PART OF THE LANDS COVERED BY THE MORTGAGE.

To a Registrar:

*Re Mortgage Y. to W.*

I enclose a letter received from Mr. G. Solicitor and I have to-day received from him the enclosed copy form of Assignment of Mortgage. Assuming the statements in his letter and the form to be substantially correct I am of opinion as follows:-

By the Assignments, the Mortgage and mortgage moneys and interest were assigned, first by A. W., Mortgagee, to A.M., and then by the Administrator of M., now deceased, to his daughter, Mrs. W. I do not think the omission from the assignments of part of the lands mortgaged is a fatal omission in so far as a Discharge of Mortgage by the Assignee is concerned. Mrs. W. is the person entitled by law to receive the Mortgage money. The whole Mortgage and mortgage money and interest were assigned to her and I think it clear that Mrs. W. is the person entitled by law to receive the Mortgage money and is therefore entitled to discharge the mortgage as regards all the mortgaged premises, notwithstanding the fact that the assignments do not recite all the lands originally given as security for the mortgage moneys.

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5. REGISTRATION OF PLAN OF A NUMBER OF LOTS LAID OUT FOR A SUMMER RESORT AND SHOWING ONE PRIVATE WAY OR BOULEVARD OR PLACE FOR RECREATION. ASSENT OF MUNICIPALITY NOT NECESSARY.

*Re proposed plan of P.*

Mr. E. as Solicitor for Mr. H. desires to register a plan of some property known as P. in the Township of I., in the County of S. The Registrar of that County thinks that it is very doubtful whether the Plan can be registered because he considers what is designated as parcel 38. upon the Plan is in fact a public highway and not being 66 feet wide and in the absence of the consent of the Municipal Council the Plan cannot be registered. He further says that being less than 66 feet wide if it is a highway the plan cannot be registered at all. He refers to my opinion in the case of a plan known as the B. Plan. The solicitor refers to an opinion of mine reported in my Report for 1911. page 45.

I have examined the proposed Plan of P. It consists of 2 ranges of lots extending from what is called C. Street easterly to the Lake. Between the ranges of lots there is an allowance for a way or boulevard or open space, marked "38" which extends from C. Street to the Lake, a distance of about 1,000 feet. At the C. Street end of it a line is drawn across 38. Doubtless it will be the mode of access to the subdivision lots which number 37 in all. Parcel 38 is 50 feet wide for a distance of 450 or 500 feet easterly from C. Street. The remainder of 38 easterly to the Lake, that is from opposite lots 13 to 30 to the Lake is irregular in width and shape and in that respect does not resemble a street; although it will apparently be the mode of access for the owners of the other lots from the easterly limit of lots 30 and 13 to the Lake. It will be a general resort for strolling along the Lake shore, for the convenience and enjoyment of summer residents who may be expected to erect cottages upon the various lots. Indeed, the avowed object of the proprietor is that the purchaser of each lot shown on the Plan shall be entitled to a right of way for all purposes in common with the owners of the other lots, over, through and upon 38, but it is candidly stated that it is not proposed that the public outside of these lot owners, shall acquire any rights in or over parcel 38 nor shall the Municipality of the Township have any right or title thereto. In other words the intention is that 38 shall remain a private way or open space and there is no intention of dedicating it as a public highway.

The case of what is known as the B. Park Plan to which the Registrar refers, was the case of a survey of a considerable extent of property subdividing it into some 229 lots. There were laid down by that plan, 5 roads, 3 avenues, 1 street, 1 boulevard and a long lane. Nearly all these roads, etc., were 66 feet wide, most of them apparently about 1,200 feet long, some longer and one or two shorter. An attempt was made in that case to name all the 5 or 6 parallel roads and all the cross-roads, etc., as block "Z." The parallel roads or streets ran north-west and south-east. There were a number of cross-roads or streets. Some of the Streets also followed the line of the Lake shore for a long distance and therefore did not run at right angles to the streets running north-west and south-east. All of these streets, etc., running in all directions and crossing each other just as streets do in an ordinary town or village, it was proposed to call block "Z." It is true that lines were drawn at the concession roads across the ends of the various streets, avenues and boulevards, roads and lane. To call all these streets, etc., one block or lot, seemed to me to be a misnomer. It was in fact a series of roads, streets, avenues, etc., forming boundaries of lots and not one block. That plan looked like

an attempt to lay out what was equivalent to a considerable village with full equipment of streets, etc., without the consent of the Municipality. The present proposed plan of P. is quite distinguishable from the B. Plan.

The P. Plan appears to have been prepared with a view in good faith of laying out a small number of lots for summer residences on or near the lake shore and of providing a really private way, boulevard and open space, not only for access by the lot owners to these lots and the Lake but as a place to be used and enjoyed for recreation purposes.

Having regard to all this and the shape and situation of parcel 38 and its being closed at C. Street. I have come to the decision, although the matter is not free from doubt to advise the Registrar that he may treat such a Plan as that proposed of P., as one not requiring the consent of the Municipal Council and as one which may be registered, notwithstanding that parcel 38 is for part of its length only 50 feet wide. What is numbered 38 should be entered in the Abstract Index as a parcel or lot.

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6. WHAT SIGNATURES OF OFFICIALS ARE NECESSARY TO AUTHENTICATE COPIES OF MONEY BY-LAWS FOR REGISTRATION.

A matter in difference has arisen between Mr. J. H. C., Solicitor, W., and the Registrar of the County of X., upon which my opinion has been requested.

The point is this. Mr. G. desires to register two money by-laws of W. by depositing with the Registrar copies, certified under the hand of the Municipal Clerk and the seal of the Corporation and on production to the Registrar of the original by-laws. His view is that under section 286 of the Municipal Act, 1913, the copies he tenders for registration are sufficiently certified for that purpose.

The Registrar does not concur in that view. He thinks that under the Registry Act, Amendment Act, 1913, the by-laws should, for registration purposes, be authenticated by the production of a duplicate original or a copy certified under the seal of the Corporation and the signature of the Head of the Corporation or of the person presiding at the meeting at which the By-laws were passed.

The provisions of the last mentioned Act amending the Registry Act are to be found in Chapter 24, Section 6, (1913). These provisions appear to be in effect the same as were the provisions of the Consolidated Municipal Act, 1903, section 396, subsections 3 and 4. They seem in substance to have been transferred from that Act to the Registry Act. Formerly there was no provision in the Registry Act on the subject.

Section 296 of the Municipal Act, 1913, is headed "Registration of Money By-laws" and contain not only provisions with respect to the manner in which a copy of a Money By-law should be authenticated for registration, but it contains special provisions as to the effect of registration, etc., and it also provides a penalty to which the Municipal Clerk shall be liable if he neglects to perform the duty imposed upon him by subsection 1, which is a duty to register a money by-law by Certificate under his own hand and under the seal of the Corporation; and that without requiring the signature of the Mayor. In fact it contains the complete legislation on the subject, as to how Money by-laws are to be registered, as to the consequences of neglect of duty, and as to the effect of registration, etc. It is further to be observed that section 296 (1) of the present Municipal Act has been expressly re-drafted and must be taken to contain the settled requirements of the Legislature as to the manner in which Money by-laws were to be registered and the effect of registration, etc. Whereas the provisions of the Registry Act Amendment Act have in reality been adopted unaltered from the old Municipal Act, without regard to the fact that the provisions of the former Municipal Act, section 396, subsection 1, have been redrafted and passed in the new and amended and different form by the Legislature. The Registry Act Amendment Act makes no provision with regard to the effect of registration or of non-registration and provides no penalty on the clerk, for non-registration, nor does it make it a duty of the Mayor to register or to sign the Certificate for registration nor make it the duty of any particular person to register it, etc. In view of the provisions of the Acts referred to, it seems to me that under all the circumstances compliance with section 296 of the Municipal Act must be deemed to be sufficient. I think it is the duty of the Registrar to register the copies of the By-laws certified by the Clerk. I think that no public disadvantage can arise from registration in compliance with the provisions of the Municipal Act.

In this particular case, owing to the absence from home of the Mayor it is impossible to get his signature to the copies. The Municipal Clerk cannot part with the original By-laws for registration purposes because under the Municipal Act, he must retain the custody of them and he cannot get duplicates nor certificates signed by the Mayor owing to this absence.

7. FEES FOR SEARCHES. WHERE A SEARCH IS MADE AND SOME DAYS AFTERWARDS A SUBSEQUENT SEARCH IS MADE INTO THE TITLE OF THE SAME LOT, BOTH SEARCHES SHOULD BE PAID FOR.

A matter has been referred to me respecting a difference touching fees for searches between Mr. D., Solicitor and the Registrar of the County of L.

Mr. D. lately made a search into the title of a lot, and seemed to be satisfied with the title. Some days afterwards he brought a document for registration affecting the lands, the title to which he had previously searched, and he again searched to see if in the interval any instrument affecting the title had been registered. The Registrar charged him fifty cents, that is 25 cents for each time he searched. Mr. D. objected to this charge upon the ground that the later search was a continuation of the previous search or a completion of it and he thought the practise in some other offices was not to charge for a second search under like circumstances. I had a similiar question before me for decision some years ago and as I adhere to the view then expressed I decide this dispute in favor of the Registrar. I think he was entitled to charge 25 cents on each occasion. The previous ruling above referred to is reported in my Report for 1896. page 14.

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8. FOR THE PURPOSES OF REGISTRATION OF A PLAN SUBDIVIDING LANDS A REGISTRAR MAY DISREGARD MORTGAGES THE DESCRIPTION OF LANDS IN WHICH MAY POSSIBLY COVER THE LANDS TO BE SUBDIVIDED BUT WHICH ARE ALL MADE AND REGISTERED SUBSEQUENT TO A CONVEYANCE MADE BY THE MORTGAGOR UNDER WHICH THE PERSONS REGISTERING THE PLAN DERIVE TITLE.

To a Registrar :

I have your letter of 21st. October.

I return the Abstract, Probate, etc. I have to observe as follows :

1. Upon registration of the Probate of the Will of J. D. you may treat his trustees who signed the Plan as apparent owners for the purpose of the registration of the Plan.

2. I note that you think that the three mortgages referred to probably do not include and should not have included the part of Township Lot 114 which the plan includes. The Deeds under which D. and H. who propose to register the plan claim title seem to be No. 4286 from F. O. to D. and H. and No. 4392 F. O. to H. Now F. O.'s title appears to be derived under Deed No. 3902 from E. H. The latter apparently acquired the whole of lot number 114 from the executors of R. M. by Deed No. 2960. The Mortgages existing at the time he conveyed to F. O. appear to be discharged. Now the three mortgages which you say contain descriptions which may cover some of the property E. H. conveyed to F. O. and which she (or he) afterwards conveyed to H. and D. are all subsequent to the Deed from H. to O. From the Registry Books, apparently H. had no right to make any subsequent mortgage over that property. H. and D. I think appear to be entitled for the purposes of registration of the Plan to ask you to go back to the origin of the O. title which was the Deed from H. to O. No. 3902. If the descriptions in any subsequent encumbrances may cover any part of the property conveyed to O. made by H. or by parties claiming under him, then I should say for the purposes of the registration of the Plan, you may treat them as not incumbrances on Messrs. H. and D.'s property. We cannot determine questions of title in these matters. The mere registration by H. and the D. executors of the Plan will not prove, admit or establish that they have a good title, free from encumbrances to the property subdivided by the Plan. Parties purchasing subdivision lots from them will have to inquire into their title. By receiving this Plan for registration you treat them merely as apparent owners free from these three mortgages but nevertheless they may not in fact have such title.

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9. To the Solicitor for a Railway Company:

*Re Descriptions in Deeds of Railway Rights of Way.*

I return description and plan of lot 2, 3rd Concession, Township of D., District of S., received to-day with your letter of 8th October. The description is as follows:—

“All and singular that certain parcel or tract of land and premises being composed of all that part of lot number two in the third concession of the Township of D., in the District of S., and Province of Ontario, containing an area of twelve and forty one hundredths acres (12.41 acres) more or less, being shown colored red on the plan hereto attached and having the limits, dimensions, and bearings shown on such plan, which plan forms part of this conveyance, and is signed by the Grantor herein, and by the Witness hereto for indentification.”

The Plan which is made expressly to form part of the conveyance shows the width and length and course and situation of the right of way conveyed and its exact position: and is in effect not only a complete description by metes and bounds, but is better, because it shows the parcel conveyed almost at a glance. It is also such a description as in the words of section 34 of the Registry Act is sufficient to enable the same (the land affected) to be traced or ascertained by a surveyor.”

I am of opinion, therefore, that such a description of lands in a conveyance of lands to your Company is sufficient for registration purposes under the Registry Act and should be accepted as sufficient by a Registrar of Deeds. You may show this letter to any Registrar of Deeds in Ontario.

I have nothing to do officially with any question arising with regard to the sufficiency of descriptions in transfers under the Land Titles Act.

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10. DISCHARGE OF MORTGAGE BY A LIQUIDATOR OF A COMPANY WHO WERE MORTGAGEES. OBSERVATIONS AS TO REQUIREMENTS IN SUCH CASES.

To a Registrar:

I return the Discharge of Mortgage L. & W. Trust Company, Limited, as Liquidators of the B. L. Company and the B. L. Company to M. A. H. and others. I am of opinion as the Discharge of Mortgage purports to be executed by the B. L. Company, and is under the corporate seal of that Company, that so far as the execution of the instrument is concerned it appears to be sufficient. It is a discharge by the mortgagees under their corporate seal. It is not, therefore, a discharge of the mortgage by a person other than the mortgagee. The Liquidator is substituted for the original officers of the Company but still he acts in the name of and for the Company and there is no provision which requires, as in the case of an attorney, that the liquidator shall register proof of his powers to execute in the name of the mortgagees. So that I think section 65 Reg. Act does not apply in such a case.

I may call attention, however, to a different question, namely, whether this instrument is sufficiently proved for registration. Under section 42 of the Registry Act an affidavit is not dispensed with merely because an instrument has the seal of the corporation attached to it. There must be the signature of the secretary, manager or attorney or presiding officer of the Corporation. Now does the liquidator come within those words? If it be said the Liquidator is attorney for the Company, then section 65 applies and the Liquidator's authority must be registered and must be shown in the Discharge. In my opinion he is not attorney for the Company. I think it would be advisable to have furnished to you an affidavit of the subscribing witness proving the execution of the Instrument. On this point, however, if the solicitors who ask registration of the instrument so desire, I will consider the matter further, but I suppose it will be very easy for them to get the affidavit of execution.

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11. A DISCHARGE OF MORTGAGE EXECUTED BY THE COMMITTEE OF A LUNATIC ESPECIALLY WHERE THE DISCHARGE IS APPROVED BY THE OFFICIAL REFEREE MAY BE REGISTERED WITHOUT REQUIRING REGISTRATION OF THE ORDER OF THE COURT APPOINTING THE COMMITTEE.

To a Registrar:

I return the Discharge of Mortgage to the Trustees of the Church.

I think there is nothing in the Act which in connection with registration of Discharges, compels the registration of the Order of the Court appointing Mr. J. to be Committee of the Mortgagee. Mr. J. does not execute the Discharge under Power of Attorney. It is the Mortgagee, by Mr. J. as his Committee, who executes the Discharge. But further, a cogent reason in favor of registration is, that the Discharge is approved by the Official Referee as appears by his signature on the margin of the Discharge. We must assume, therefore, that Mr. J. is in fact the Committee duly appointed by the Court.

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12. A WILL WHICH AFFECTS LANDS WITHOUT LOCAL DESCRIPTION MAY BE REGISTERED IN THE SEPARATE REGISTER WITHOUT BEING FIRST REGISTERED IN THE GENERAL REGISTER PROVIDED IT HAS ATTACHED TO IT A STATUTORY DECLARATION DESCRIBING THE LAND AFFECTED.

The question which has arisen upon a reference before me between the Registrar and Mr. W. Solicitor is as follows, as stated by the Deputy Registrar:—

"I have had tendered for Registration Probate of Will affecting lands without local description, together with a sworn copy of same with a Statutory Declaration attached to the copy setting out the lands affected by the Will. I refused to register same, with declaration attached and returned the Will and copy, unregistered. The Solicitors' Clerk then detached the Statutory Declaration, and I registered the Will in the General Register."

The Solicitor's Statement is as follows:—

"I tendered a Probate for registration with sworn copy for registration and Statutory Declaration attached under section 34 of the Act giving local description of the lands affected by the Will. This was refused and in my absence and without my knowledge on the representation of the Deputy Registrar that he would not register the document, my clerk detached the Declaration and the Deputy Registrar then proceeded to register the document in the General Register under subsection 6 of section 23, thereby necessitating the filing of another declaration under subsection 2 of section 23."

Section 34 of the Registry Act enacts that except as provided by subsection 6 of section 23, no instrument which affects land without local description shall be registered unless the instrument when offered for registration in addition to the ordinary proof for registration has attached to it a Statutory Declaration etc., describing the land. Subsection 3 of section 34 enacts that where an instrument has been or is recorded in the General Register particulars thereof may be recorded in a separate Registry Book by the registration of a like Statutory Declaration. Subsection 6 of section 23 is prohibitory in so far as it prevents registration in the General Register of any instrument other than Wills, Probates, Grants of Administration, Powers of Attorney, etc., in which there is a general devise or power affecting lands without local description. It does not, however, in my opinion, compel the registration in the General Register, of all Wills in which there is only a general devise of lands. If a Will devises lands by particular description it would go into the separate register, but why should a Will not go into the Separate Register under section 34 if the description of the lands affected is supplied by a Statutory Declaration instead of being set forth in the Will? And why should there have to be a round about method of securing the entry of the Will against the particular land, namely by first registering the Will in the General Register and then by Statutory Declaration under subsection 3 of section 34 having particulars of the Will entered in the separate Registry Book?

I am of opinion, reading the two sections together and having regard to the reason of the thing, that the Solicitor's contention is right and that a party registering a Will which contains no sufficient description of lands affected by it can attach a Statutory Declaration to supply the description and have the Will registered in the proper separate Register without first registering it in the General Register. I think in this case therefore, if the Solicitor so desires he may have it entered in the separate Register by Statutory Declaration, and,

under the circumstances, the expenses of doing so, including registration in the General Register, should not exceed what he would have had to pay had the Registrar complied with the Solicitor's original request.

I ought to add that this is the first occasion so far as I remember in which the specific question which arises in this case has been presented for my opinion, and further, I do not think the Registrar exceeded his duty in hesitating to register the Will in the separate Register under the circumstances stated. Several of my opinions reported, although they are in cases distinguishable from the case in hand, might lead the Registrar to infer that the course he took in this matter was correct.

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13. A WILL MAY BE REGISTERED IN SHORT FORM IN GENERAL REGISTER WHERE THE EXECUTOR MAKES AFFIDAVIT THAT THE WILL DOES NOT AFFECT LAND IN REGISTRY DIVISION EXCEPT IN REGARD TO MORTGAGES—NOTWITHSTANDING THAT THE WILL DEVISES LAND IN THE REGISTRY DIVISION BY PARTICULAR DESCRIPTION, WHICH LAND THE TESTATOR HAD DISPOSED OF AFTER MAKING HIS WILL.

Mr. P. Solicitor, and the Registrar of the County of X. differ in opinion regarding the registration of the Will of one R., and the difference has been referred to me. The Solicitor is one of the executors of the Will of R., and he desires to register that Will under section 65, subsections 4 and 5 of the Registry Act which provides for what may be called short registration of the Probate of a Will. That is where the Will is, including the Probate, over 7 folios in length and does not affect land in the Registry Division except in so far as the testator was holder of a Mortgage. The partial copy of the Probate of the Will, submitted for registration in this case, was accompanied by an affidavit of the executor verifying it and stating amongst other things, that the Will does not affect land in the Registry Division except in so far as the testator was the holder of a Mortgage comprising land in the Registry Division.

The difficulty here has arisen from the fact that the Will contains a devise of real estate being the south half of lot No. 1 in the east side of M. Street, in the Town of XI. It also directs legacies to be paid, and disposes of personal property. The Will is dated 13th October, 1903. The testator died 2nd April, 1913. The Solicitor says that after the making of the Will and prior to his death, the testator disposed of the XI land and he does not wish to register the Will against that land, as it would cast a cloud on the title to that property. The Solicitor submits that the object of section 65 is clear, that it overrides section 56 of the Registry Act, in a case of this kind, where there is absolutely no property affected by the will, except that as to which the Discharge of Mortgage only is to be given. He points out that the Will speaks only from the date of the death of the Testator and that real estate although devised by it, cannot be affected by it, if it has been disposed of in the lifetime of the Testator.

In support of his view, the Registrar points out that the former Registry Act, section 70 subsection 2, a subsection which is left out of the present Act 10 Ed. VII, contained a provision by which a will could be registered in the manner suggested by the Solicitor, but that at present the Act does not contain that provision: in fact, that provision has been repealed. The Registrar thinks and he says he is supported by the opinions of several legal gentlemen that the present Act does not provide for the registering a Will in short form, if the will devises land, and describes such land by a proper description.

What formerly was subsection 2 of section 70 provided for the registration of a Statutory Declaration showing that subsequent to the making of the Will, the testator had disposed of lands mentioned in the Will. It also provided that the Registrar upon such a Declaration should not enter the Will against lands so disposed of. That section originated in an amendment to the Registry Act, passed I think, in the year 1887. The subsections upon which Mr. P. relies, now 65 and subsection 4 and 5, were enacted some years afterward, and down to 1910 both sections were continued as parts of the Registry Law.

In this matter while the Will, made 10 years before the Testator's death, purports to devise land in XI, it does not and cannot affect that land, because by

the Registry Books there appears to be a Conveyance by the Testator of that land in his lifetime. That in fact revoked the Will in so far as the devise of that land was concerned. The affidavit of the executor under subsection 5 of section 65, stating that the Will does not affect land in the Registry Division except in so far as the Testator was the holder of a Mortgage, etc., is substantially correct, in view of the circumstances. It is not clear that the Registrar has a right to go behind that affidavit and the part of the Probate and Will accompanying same. If he has, has he not also the right to look at his books from which he can ascertain that the Executor's affidavit is substantially true?

On the whole I am of opinion that this Will may, under the circumstances, be registered under section 65 subsection 4 and 5. This opinion comports with what is convenient and proper having regard to the rights of the present owner of the XI land. I cannot see that it can possibly prejudice the right of any one, and it substantially complies with the Registry Act. The Registrar, however, in registering this Will in the General Register may in his Certificate show that it is registered under the provisions of section 65, subsections 4 and 5.

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14. A MORTGAGE MADE TO A PARTNERSHIP MAY BE DISCHARGED BY ONE OF THE PARTNERS, WITHOUT REQUIRING THE REGISTRATION OF THE PARTNERSHIP.

To a Registrar:

I have your letter of 25th inst., I return the Discharge, W. Brothers to M. I think you may register this discharge without requiring the registration of the partnership under the Act for the registration of co-partnerships. It will be well, however, for you to note in the column for remarks in the Abstract Index, that the Discharge purports to be signed by G. E. W. as one of the members of the partnership firm of W. Brothers, and in any certificate you give showing Discharge of Mortgage you should state by whom the Discharge purports to be executed.

It is a general principle of the law of partnership that one member of a firm may collect a debt due to the firm and give a discharge for that debt. I think section 65 of the Registry Act does not apply to such a discharge as that now enclosed.

15. AN AFFIDAVIT OF EXECUTION OF AN INSTRUMENT SWORN BEFORE A COMMISSIONER FOR TAKING AFFIDAVITS FOR USE IN THE SUPREME COURT OF JUDICATURE IN ENGLAND, IS SUFFICIENT WITHOUT A CERTIFICATE BY THE COMMISSIONER THAT HE HAS NOT AN OFFICIAL SEAL.

I have been asked to decide a difference which has arisen between C. & Co., Solicitors, and the Registrar of the City of X.

The facts are as follows:—The solicitors tendered for registration, an Instrument, the affidavit of execution of which was sworn before a Commissioner for taking affidavits for use in the Supreme Court of Judicature in England. No official seal of the Commissioner was attached to the affidavit and the Commissioner did not certify that he had not an official seal. The Registrar objects to this affidavit as insufficient because the Commissioner has not certified that he had not an official seal.

Section 37 of the Registry Act provides that an affidavit made under the authority of the Registry Act shall be made before the Registrar or Deputy Registrar of the Registry Division in which the land lies, or before some person authorized by law to take affidavits in and for use in Ontario. Subsection 2 provides that where an Affidavit of execution is made out of Ontario before a person who has not an official seal, it shall be sufficient for him so to certify. Then there are references at the end of section 37 to the Interpretation Act, section 20 (1907) and The Evidence Act, section 38 (1909). The Interpretation Act, section 20 provides that the oath may be administered, by amongst others, a Judge of any Court, a Notary Public, a Justice of the Peace or Commissioner having authority or jurisdiction in the place where the oath is administered.

Then section 38 of The Evidence Act refers to affidavits made out of Ontario. That section expressly provides that where an affidavit is made before a Notary Public it shall be certified under his hand and official seal. Clause "k" of section 38 of The Evidence Act, authorizes an affidavit to be made before a Commissioner authorized by the laws of Ontario to take such affidavits. Is the Registry Act to be held to mean that such a Commissioner, or a Commissioner under clause (a) has to certify that he had not an official seal? And so with regard to an affidavit made before a Judge of a Court. Courts have Official seals but the Judges have not. It is common knowledge that commissioners, who administer oaths, have no official seals, and I think it is so also with regard to Judges. Clause 2. of section 37 Registry Act does not require an official seal. I do not regard subsection 2 of section 37 of the Registry Act, as a prohibitory clause at all. It is an enabling clause and should be construed accordingly. It applies to enable a Notary Public to administer the oath without attaching an Official Seal, by permitting him to state that he has no Official seal. Subsection 2 of section 37 of the Registry Act does not add to the requirements of section 38 of the Evidence Act. It dispenses with so much of that section as expressly requires an Official Seal, by providing for a Certificate that the person has not an Official Seal.

I decide this dispute in favor of the contention of the solicitors.

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## 16. WIDTH OF HIGHWAYS LAID OUT ON PLAN OF SUBDIVISION OF LOTS.

To Civil Engineers:

*Re F. Plan.*

I have considered the circumstances stated in your letter to me of 31st ult., enclosing a Plan which you wish to have registered showing a street less than 66 feet in width. You state that the Council is prepared to give its assent to this Plan, but you wish to know whether I think, under the law as it now stands, this Plan may be registered with such assent. I understand from you that the Plan was prepared upon the promise of the Council to give its assent to it: but without the parties concerned having had the provisions of section 479 of the Municipal Act brought to their notice. I have to observe as follows:—

Subsection 14 of section 80 of the Registry Act provides that the Registrar shall not register a Plan on which a road or street less than 66 feet wide is laid out unless the assent of the Municipal Council is registered therewith.

By the Municipal Act passed this year section 479 it is provided that no Municipal Council or owner of lands shall lay out any highway less than 66 feet in width, etc. My opinion is that section 479 of the Municipal Act now deprives the Council of the power it formerly possessed under subsection 14 of section 80 Registry Act to give its assent to a plan showing a road or street less than 66 feet wide: and indeed it goes further for it provides that *no owner of lands shall lay out a highway less than 66 feet in width*. I think the provisions of section 479 supersede so much of subsection 14 of section 80 of Registry Act as inferentially, authorizes the Council to give its consent to a highway less than 66 feet in width.

I apprehend that even if from inadvertance or otherwise, a Registrar should now accept a Plan showing a highway less than 66 feet in width, the registration might be void, even if the Plan had the sanction of the Council.

I return the Plan.

MEMO.—In the session of the Legislature, 1914, sec. 479 of the Municipal Act, R.S.O. 1914, was repealed and a new section substituted.

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17. INCOMPLETE INSTRUMENT CANNOT BE REGISTERED. STATUTORY DECLARATIONS OF EXPLANATIONS CANNOT BE REGISTERED. A MORTGAGOR IS A COMPETENT WITNESS TO ASSIGNMENT OF MORTGAGE. OBSERVATION *re* DISCHARGE OF MORTGAGE.

To a Registrar:

I return Assignment of Mortgage to Company, also Discharge from the Company to D., also a copy of the Assignment of Mortgage. I have to observe as follows:—

1. I do not think it was proper to detach the Mortgage from the Assignment of 3rd October, 1895. The Assignment without the attached Mortgage is an incomplete document. The Assignment does not even name the parties to the Mortgage or give any particulars regarding it except that it states the amount of the alleged mortgage. It merely assigns "the hereunto annexed mortgage." There is no authority for registration of such a Declaration of explanations as that of Mr. D. If the parties desire to register this Assignment they may do so by re-attaching the Mortgage and restoring the Assignment to the same condition as when T. executed it. The Statutory Declaration must be detached from assignment as it cannot be registered.

2. I presume as the Mortgage was registered, it contains a sufficient description of the lands, so that if the assignment is restored to its original condition it will be unnecessary to furnish a Statutory Declaration giving a description of the lands affected by the Assignment under section 34, Registry Act. If it should be necessary to supply such a Declaration it would have to be made by one of the parties to the Assignment of Mortgage or his attorney or heirs, etc. Mr. D. does not appear to be one of the parties competent to make such a Declaration if it became necessary to furnish one.

3. Mr. D. the Mortgagor, was competent to be a witness to the Assignment and competent to make the affidavit of execution as he is not a party to the Assignment.

4. I do not know what is meant by asking me regarding a copy of the Assignment of Mortgage. A copy of the Assignment of Mortgage cannot be registered. If after registration of the original the parties want you to give a certified copy of the registered Assignment you may give that.

5. It appears the Discharge was executed in 1895. That was prior to the amendment of the Act, which requires the Discharge to mention the date of registration and registry number of such an Assignment as that by T. to the Company. I think that if the Assignment of Mortgage is registered you should not insist on the Discharge either reciting or having endorsed on it particulars of the registration of the Assignment of Mortgage. The Discharge was a completed instrument at the time it was executed. It may be regarded as sufficiently indentifying or referring to the Assignment of Mortgage as the law at that time stood. The Assignment of Mortgage must, however, first be registered before the Discharge can be registered.

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18. PARTICULARS OF REGISTRATION OF A POWER OF ATTORNEY UNDER WHICH A DISCHARGE OF MORTGAGE IS EXECUTED MAY BE STATED EITHER IN OR ENDORSED UPON THE DISCHARGE.

To a Solicitor:

DEAR SIR,—I have your letter of 19th inst.

I think the particulars of the Power of Attorney which you say you are in the habit of placing on the face of a discharge of Mortgage, is a sufficient statement of particulars to comply with the Act.

Where you give the particulars on the face of the Discharge it is not necessary to endorse the same on the Discharge, for the endorsement would only be a repetition of the particulars.

It was not intended that particulars should be required to be given both on the face of and by endorsement on the discharge. Sometimes a discharge is sent to be registered along with the Power of Attorney or other instruments for registration and it prevents delay if there is authority to endorse on the discharge the particulars of registration of the Power, etc.

It is not necessary to verify by affidavit the endorsement, where one is made.

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19. IN CONNECTION WITH THE REGISTRATION OF A PLAN OF SUBDIVISION IT IS NOT NECESSARY TO ENQUIRE INTO TITLE PREVIOUS TO THE REGISTRATION OF A CERTIFICATE OF TITLE UNDER THE QUIETING TITLES ACT. OBSERVATIONS AS TO MEASUREMENTS OF LOTS EXTENDING TO A LAKE SHORE.

To a Deputy Registrar:—

*Re Plan of Lot 26, Con. A.*

In answer to your letter I have to observe as follows:

1. The Certificate under the Quieting Titles Act certifying that the property belongs to W. C. excepting the westerly 18 acres, renders it unnecessary for you to look into the previous title in connection with the registration of this Plan. You have a right to treat W. C. or his grantee as apparent owner of the land covered by the Certificate. It is not necessary that the plan should show anything regarding boundaries of the different parcels previously sold for taxes.

2. I think you may accept the Plan, notwithstanding that the posts along the lake shore appear to be planted at different short distances back from the lake shore and that the lengths marked "as the lengths of the shore lots" are the lengths "more or less" apparently. We may treat lands facing the lake shore as exceptional, in view of the shape of the Bank or shore or from their shifting nature. The surveyor has probably done the best he could do under the circumstances. You may accept the Plan in this respect as sufficient "ex necessitate."

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20. A SO CALLED PROBATE OF WILL IS NOT COMPLETE FOR REGISTRATION UNDER SECTION 56 REGISTRY ACT UNLESS A CERTIFIED COPY OF THE WILL FORMS PART OF THE PROBATE.

To a Barrister:

The Registrar of X has written to me on the subject of the registration of a document purporting to be "Letters Testamentary" or "Probate" of the will of one H. C. H., the Letters Testamentary being an exemplification or certified copy from the office of the Surrogate Court of the County of N. in the state of New York. I do not think there is any difficulty with regard to the name of the document, that is, as to whether "Letters Testamentary" mean the same as "Probate." So far as that point goes I think the instrument may be treated as the formal part of the Probate. There remains, however, the question as to the Will not being attached to the Probate.

Section 56 of the Registry Act which is headed "Wills" begins by enacting that a Will shall be registered in a certain manner. Sub-clause "B" provides in effect that a Will shall be registered by the production of Probate or the Letters of Administration with the Will annexed or exemplification thereof, etc. The Probate is the mere formal certificate of the Court stating the Will of H. C. H. has been proved, etc. It refers to the "said Will" and states Mr. H. is executor. I do not think registration of this formal part could be deemed to be registration of a Will, by the Probate unless a certified copy of the Will is attached to the formal certificate of the Court. An executor derives his authority from the Will itself, and the Probate is merely prima facie evidence that the Will has been duly executed and has been approved and allowed by the Court, etc. To register this mere certificate will not put any one in possession of the contents of the Will. It will not be possible for any one safely to do business with the executor regarding lands or a Discharge of Mortgage as there is nothing to show what his powers are. I am of opinion that a certified copy of the Will should for the purposes of registration under section 56 Registry Act, be attached to the formal part of the Probate. I consider the Probate is incomplete without such certified copy of the Will.

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21. WHERE TWO OUT OF THREE TRUSTEES WHO EXECUTE A DISCHARGE OF MORTGAGE WERE NOT MORTGAGEES THE DOCUMENT UNDER WHICH THE NEW TRUSTEES CLAIM INTEREST IN THE MORTGAGE SHOULD BE REGISTERED, ETC.

To a Registrar:

*Re Discharge of Mortgage F. to J.*

I am of opinion that the documents under which two of the three persons, who profess to discharge the mortgage, namely, D. and K., Trustees, claim interest in or title to the mortgage money, should be registered and of course that the particulars of the registration of such documents should either be contained in the discharge itself or endorsed thereon.

In this case F. one of the original three trustee mortgagees signs the discharge, but he does not sign as a surviving trustee. The other two original trustees were the late M. A. M. and the late R. B. and the new trustees have been elected or appointed by the beneficiaries in the place and stead of M. and B. and these new Trustees who are D. and K., are not only parties to the discharge as executed, but they claim that they, along with Mr. F., are the persons entitled by law to receive the money.

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22. A GRANT OF ALL THE REAL ESTATE OF A. WITHOUT LOCAL DESCRIPTION MAY NOT BE REGISTERED IN THE GENERAL REGISTER MERELY BECAUSE THERE IS ALSO IN THE INSTRUMENT A POWER OF ATTORNEY IN FAVOR OF THE GRANTEE TO MAKE SALES. OBSERVATIONS.

To a Solicitor:

*Re C. Estate.*

I have your letter of yesterday's date. I have perused the instrument and have to observe as follows:

1. The operative parts of the instrument seem to be, first the release to the parties of the Second Part and the estate of J. C. from all claims, and provisions for the taking possession of the estate, excepting the residence, and the management and disposal of the estate, and providing in certain contingencies for a division of any surplus. Then the parties of the First Part grant to the parties of the Second Part all the estate, etc., of the parties of the First Part, etc., in the real estate of J. C. deceased, whether it stands in his name or in the name of R. C., etc. Also all the personal estate. Then there is a covenant for further assurance. The Power of Attorney which then follows empowers the parties of the Second Part or either of them to sell all the lands which constitute the estate of J. C.

2. It seems to me that the Power of Attorney is merely incidental to the grant of the land and I think on the whole the instrument should for registration purposes be accompanied by a Statutory Declaration describing lands affected. You can in it describe one or more lots you are certain are affected by the instrument and that will enable you to register the whole instrument or you may describe in the instrument *all* the lots you are certain of and then you may, if you find out there are other lots on which you ought to register the instrument, do so afterwards under subsection 2 of section 34 of the Registry Act.

3. Registration of the instrument thus in the separate registry book is as effectual so far as the instrument may be deemed to be a Power of Attorney, as would be registration in the General Register.

4. Probably you have already considered my next observation which is that if the instrument were to be registered in the General Register the registration of it there, in so far as it is a grant of land would, in all probability be void. It would not, I think, constitute notice to subsequent purchasers or mortgagees from the Grantors of the lands affected.

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23. WHERE A DISCHARGE OF MORTGAGE MADE BY A NUMBER OF TRUSTEES OF A CHURCH DOES NOT NAME ALL THE TRUSTEES WHO WERE MORTGAGORS, BUT, IT CLEARLY IDENTIFIES THE MORTGAGE, IT IS SUFFICIENT FOR REGISTRATION PURPOSES.

To a Registrar:

Regarding the discharge of mortgage S. to R. and others, trustees of the church, the question you submit for my opinion is as to whether or not the certificate of discharge is sufficient for registration purposes. It is executed by the mortgagee, one C. D. S., and its execution by him is proved. It certifies that G. R., of the Township of C., farmer, "and others," not naming the others, "the trustees of the A. church, at B.," have satisfied the money, due, etc., under the mortgage "made by the said G. R. and others, being trustees of the A church," to G. D. S., and then it appears to fully describe the mortgage by date and by giving all particulars of registration necessary to identify it.

I am of opinion that this is a sufficient discharge of the mortgage for registration purposes, although it does not name more than one of the trustees who were mortgagors; yet it clearly and sufficiently identifies the mortgage intended to be discharged.

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24. A MORTGAGE MADE TO HUSBAND AND WIFE AS MORTGAGEES MAY BE DISCHARGED BY THE SURVIVOR WHERE THE MORTGAGE WAS MADE TO THEM JOINTLY AND NOT IN SHARES.

To a Registrar:

*L. Discharge.*

I am of opinion that the discharge by the surviving mortgagee may for registration purposes be deemed to be a sufficient discharge of the mortgage.

The mortgage was made to John L. and Josephine L. his wife, as mortgagees. It is dated 28th March, 1901. The discharge is by Josephine L. and it states that her husband, one of the mortgagees, died 7th October, 1906. The mortgage is in the ordinary form, and it appears to be made for money belonging to the two mortgagees on a joint account, or it is made to them jointly and not in shares. Under section 4 of the Mercantile Law Amendment Act the money is to be deemed as belonging to the two mortgagees on a joint account as between them and the mortgagor, and the receipt in writing of the surviving mortgagee is a complete discharge for the money.

By the form of discharge of mortgage under the Registry Act the person signing the discharge is required to say and he should be the person entitled by law to receive the money; and I think that, under the circumstances stated, Josephine L., who signed the discharge as surviving mortgagee, is in fact the person entitled by law to receive the money, and is the person entitled by law to discharge the mortgage by certificate.

In this particular case also, it may be observed that as the legal estate in the land was transferred to husband and wife they took an estate in the land by entirety, and the whole legal estate in the land under the mortgage is now vested in the survivor. Of course the validity of the discharge by the survivor depends upon the truth of the allegations contained in the instrument of discharge to the effect that she is the survivor; and it would be well therefore for you in entering the certificate to state in the abstract index that the discharge is executed by Josephine L. claiming to be the surviving mortgagee, and, of course, in any certificate you give, showing the discharge of the mortgage, you will state that the discharge purports to be executed by Josephine L. as surviving mortgagee.

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25. WHERE A MORTGAGE WAS ASSIGNED BY WAY OF MORTGAGE TO SECURE PAYMENT OF A SUM LESS THAN THE ORIGINAL MORTGAGE MONEY A DISCHARGE OF THE ORIGINAL MORTGAGE EXECUTED BY THE MORTGAGEES UNDER THE ORIGINAL AND DERIVATIVE MORTGAGES IS A GOOD DISCHARGE OF BOTH MORTGAGES.

To a Registrar:

*Re H. and S.*

The matter you state for my opinion is as follows:—

A mortgage was registered 8th December, 1910, made by George H. and wife to Nathan S. An assignment of this mortgage by way of mortgage was registered 31st May, 1911. This assignment was made by Nathan S., the original mortgagee, to Margaret B. The consideration expressed in the original mortgage was \$4,500. The consideration expressed in the assignment of mortgage by way of mortgage was \$2,000.00. Neither instrument was recorded in full. In entering the assignment of mortgage by way of mortgage in your abstract index you entered it as a mortgage of a mortgage and as not recorded in full.

There is now presented to you for registration a certificate of discharge of the original mortgage executed by Nathan S., the original mortgagee, and by Margaret B. the derivative mortgagee. The certificate states that the mortgage was assigned or mortgaged by Nathan S. to Margaret B. by indenture of mortgage dated 20th May, 1911, and properly gives particulars of the registration of the assignment. It concludes by stating as follows: "That we are the persons entitled by law to receive the money and that such mortgage is therefore discharged."

Your view is that according to your books and according to the instruments on record there are in fact two mortgages, one the original mortgage and another the derivative mortgage, and that for registration purposes there should be two separate discharges if the incumbrances are to be discharged by certificate, or that there should be a discharge of one by certificate and a release under seal of the other to properly clear both mortgages off the property. You have favored me with a copy of the letter of the solicitor, who offers the discharge for registration. His view is that it is only one mortgage that is being discharged. That is the original mortgage; and in order to properly discharge that original mortgage both the mortgagee under the second mortgage and the mortgagee in the first mortgage should join in the certificate, and when they both join as here in signing the certificate that document makes a complete discharge.

I agree with the contention of the solicitor. Margaret B. has an interest in the mortgage money to the extent of \$2,000.00, and the original mortgagee has an interest in the residue. Together or jointly they are the parties entitled by law to the whole of the original mortgage money and interest, and upon payment of that money by the mortgagor he is entitled to their receipt. Their receipt for the full mortgage money virtually discharges the mortgage and frees the property of the original mortgagor from all claims by the derivative mortgagee as well as by the original mortgagee. I think, therefore, the discharge as presented to you should be registered. In my opinion it will effectually release the land from all claims both by the original mortgagee and by the derivative mortgagee.



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26. WHAT ARE DISBURSEMENTS INCIDENT TO THE BUSINESS OF A REGISTRY OFFICE.

To a Registrar:

You have asked my opinion as to whether you are or are not entitled to deduct as disbursements incident to the business of the office or as being furniture for the office, matters hereinafter mentioned.

First: "Ribbon for book copying, type-writing machine." I think such an item may be properly charged to the city, if the machines have been furnished by the city.

Second: "Repairs to type-writing machines." I give the same answer to this.

Third: "Ink" for use in the office. I think this may be deemed to be "stationery" and comes within Clause 4 of my opinion reported in my report for 1912, page 9.

Fourth: "City Directory." I do not think this item may be deducted.

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27. CERTAIN OLD DISCHARGES OF MORTGAGE EXECUTED BY ATTORNEY MAY BE REGISTERED WITHOUT REQUIRING REGISTRATION OF THE POWERS OF ATTORNEY.

To a Registrar:

*Re Discharges of Mortgage.*

I have your letter of 6th inst. I have to observe as follows:—

1. Regarding the discharge by John C. by W. M., his attorney, I am of opinion that, as that was a completed instrument capable of registration on *9th May, 1885*, when it was executed, it may be registered without registration of the Power of Attorney.

2. Regarding the other discharge, dated *10th July, 1895*, signed B. T., by his attorney J. C., I think that the discharge was a completed instrument capable of registration, as the law stood at the date of it. The Act requiring registration of a Power of Attorney contemporaneously with or prior to the registration of the instrument, was not passed until 1st July, 1899, and section 4 of chapter 22, 58 Vict. (1895) was not made to apply to powers of attorney until the passing of the Act of 1899, chapter 16, 62 Vict. (2): so that this discharge executed by B. T. by his attorney was a complete instrument eligible for registration at the time it was executed, and may therefore, I think, be registered now, without requiring the registration of the power of attorney.

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28. IMPERFECT EXECUTION AND VERIFICATION OF CONVEYANCE BY A COMPANY AS GRANTORS. OBSERVATIONS AS TO SIGNATURE OF A PERSON PURPORTING TO COUNTERSIGN THE CONVEYANCE.

To a Registrar :

*Re E. W. Land Company and M.*

I to-day received your letter of the 14th inst., with the papers. The circumstances appear to be as follows :

A conveyance is sent to you for registration purporting to be made by the E. W. Land Co. of T., as grantor, to Sarah M., as grantee. It purports to grant two lots in the Township of X, in your county. It apparently is executed "E. W. Land Company, W. L. Trustee." Opposite Mr. W.'s signature there is an ordinary seal, but underneath there is a seal with the impression "E. W. Land Co." The word "Limited" is not anywhere used. There is a witness, one H., who makes an ordinary affidavit of execution. The affidavit of execution purports to be to the effect that the witness saw the instrument executed by W. L., one of the parties thereto. That the said instrument and duplicate were executed by the said party, etc.

Then, near the signature of the witness to the attestation clause, there is the word "Countersigned," apparently signed by P. T., and there is a seal which I suppose is intended to be opposite this countersigning signature. That signature is written across or nearly across the margin of the deed, and at right angles to, but not under the signature of the attesting witness. P. T. is not a party to the instrument nor is his signature attested or proved. I observe as follows :

1. The affidavit of execution is insufficient so far as an affidavit is necessary, because it proves the execution of the instrument by a party who is not a party to the instrument.

2. Neither in the description of the grantor in the deed nor in the seal of the company attached to the deed is there anything to show that the company is an incorporated company.

3. By Section 42 of the Registry Act the seal of a corporation affixed to an instrument with the signature of the secretary, manager or attorney or presiding officer thereof, is sufficient evidence, for the purpose of registration, of the due execution of the instrument. Here, however, there is nothing to indicate, as I have said, that the company is a corporation, nor is there any signature of a secretary, manager or attorney or presiding officer thereof, if it be a corporation.

4. Regarding the countersigning by P. T., I have to observe that, as he is not a party to the instrument, his countersigning cannot be registered; unless indeed his signature is fully attested and proved. But, by way of suggestion, the parties concerned may consider whether it will not be sufficient for the purpose they have in view, to have Mr. T. attest the instrument as a witness or as one of the witnesses.

5. Of course if the land company is incorporated by special Act of Parliament, and if the instrument is signed by one of the officers enumerated in Section 42 of the Registry Act the instrument may be registered. I think we have a right to assume, in the absence of the word "limited," that the company has not been incorporated under any General Companies Act.

29. OBSERVATIONS REGARDING REGISTRATION OF A MONEY BY-LAW AFTER THE  
LAPSE OF FOUR WEEKS.

To a Registrar :

*Re Registration of Money By-law.*

I return certified copy of by-law received with your letter dated yesterday. I think, notwithstanding the elapse of the four weeks, you may register the by-law. Probably the provisions of the statute are to be deemed to be *directory* only, with regard to the four weeks, for, while doubtless a municipal clerk should register such a by-law within the four weeks, still, I do not think, registration of the by-law, after the expiry of the four weeks, would be void.

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30. THE CERTIFICATE OF DISCHARGE OF MORTGAGE SIGNED BY EXECUTORS OF THE SURVIVOR OF TWO JOINT MORTGAGEES, MAY BE REGISTERED.

To a Registrar :

Regarding Discharge of Mortgage, S. to P. received with your letter of yesterday, the circumstances are as follows:

A Mortgage dated 1st September, 1910, and registered same day by S. as mortgagor was made to Edgar W. P. and Lilius A. P. as mortgagees, to secure the payment of \$5,000.00 and interest. The mortgage appears to have been made to the mortgagees jointly and not in shares. Both mortgagees are dead, according to the statement in the Discharge of Mortgage, Lilius P. having died 10th August, 1912, and Edgar W. P. the surviving mortgagee, having died 21st December, 1913. The Discharge is by Alice P. and Henry W. M., executors of the last will and Testament of Edgar W. P. the surviving mortgagee, and the Discharge recites that Probate of His Will was granted to them as executors on the 19th January, 1914, and has been July registered in your office. The question now is can you register the Certificate of Discharge of Mortgage executed by the two executors of the Will of the surviving mortgagee, Edgar W. P.?

I am of opinion that you may register this Discharge. By section 10 of the Mortgages Act, chapter 51, 10 Edward VII, Ontario, the payment in good faith of the mortgage money and the discharge acknowledging receipt of it by the executors of the surviving mortgagee, effectually discharges the person paying the same from seeing to the application or being answerable for the misapplication thereof, unless the contrary is expressly declared by the mortgage. In this case there is nothing to the contrary in the mortgage; but further by the Mercantile Law Amendment Act, chapter 63, 10 Edward VII, section 4, it is enacted that where the mortgage is made to more persons than one jointly and not in shares, the mortgage money is to be deemed to belong to the persons on joint account, as between them and the mortgagor, and it is declared that the receipt in writing of the personal representative of the last survivor of the mortgagees, shall be a complete discharge for all money due upon the mortgage; and it is so, notwithstanding any notice to the mortgagor of a severance of the joint account. This section, however, only applies if a contrary intention is not expressed in the mortgage. Here there is no contrary intention expressed in the mortgage.

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31. OBJECTIONS TAKEN BY SOLICITORS TO ABSTRACT FURNISHED BY REGISTRAR.  
OBSERVATIONS ON SEVERAL POINTS AS TO FORM AND CONTENTS OF ABSTRACT.

Some matters in difference touching an Abstract have arisen between the Registrar of the County of X. and Messrs. A. Solicitors. The Abstract of Title referred to is of part of Lot No. 2 in the Second Concession of the Township of N. as described in a certain registered Deed No. 3911 in the Abstract being required from the Crown.

The original form lot was patented in 1838 as a 200 acre lot. The land described in Instrument 3911 was 10 acres part of the west half of the original lot. So far as I can judge from the Abstract that parcel of 10 acres was first separately dealt with by an instrument numbered 1926, and the subsequent instruments on the abstract, some 18 in number, apparently all relate to the same 10 acres. There were 28 instruments subsequent to the patent registered prior to No. 1926, and apparently these instruments affect the 10 acres. The Abstract is in the ordinary form but it has on it a printed note in the following words:

“Note: The following entries (which are certified except as to Wills and Instruments affecting lands without local description) make no mention of the estate taken by the Patentee or Grantees, nor of the conditions, limitations and provisoes contained in the Patent and subsequent registrations. In the absence of the Patent and of the Original Instruments, these particulars can only be discovered by reference to the records preserved in the Crown Lands Department, or in this Office.”

This Note, I understand, is printed on abstracts hitherto issued from the Office of the Registrar of X. It was the form in use before the present Registrar was appointed.

Mr. L., who owns, or was interested either personally or through his wife in, the 10 acres, came to the Office on the 19th February with Mr. B. the former Deputy Registrar and asked the latter to order the abstract for him. I may say here that I know Mr. B. was thoroughly familiar with the work of the Registry Office. A written memorandum or order was given by Mr. B. to Mr. L. reading “10 acres as described in No. 3911, N.X., part of west half in Lot 10 in the 2nd Concession new survey N.” Mr. L. handed this memorandum to the present Deputy Registrar who prepared the abstract and afterwards forwarded same to the Solicitors according to instructions given by Mr. L. Mr. B. next day acting for Mr. L. registered a Discharge of Mortgage affecting the 10 acres and on the same day Mr. L. paid for the Abstract and received a receipt from the Deputy Registrar.

No instructions were given for the Abstract other than the memorandum made by Mr. B. and brought in by Mr. L. No objection was made to the abstract by any one except the Solicitors. Mr. B. was satisfied with the abstract and said it was the only one that could be given of the property. When the Solicitors received the Abstract they wrote on the 20th February to the Registrar stating in effect that section 19 of the Registry Act, 1910, had not been complied with, that is to say that the certificate and the abstract were not in accordance with the Act. This I presume refers to the note above quoted. They also stated other objections such as that the Abstract did not give sufficient particulars of the documents to identify the description and that the abstract was they say only an abstract of the documents in the Registry Index affecting the property and not an abstract of title under the Act, etc.

The matter has been approached on both sides in a friendly spirit with a view of having the points settled partly for future guidance as to what solicitors are entitled to receive in ordering an Abstract and as to the duties of the Registrar, etc.

I observe as follows:

1. Under section 19 of the Registry Act the Registrar when required has to make searches and furnish abstracts of and concerning all instruments or memorials registered which mention any lot of land, etc., or any part of a lot where the same is clearly described and can be identified in connection with the chain of title or has been ascertained by actual survey. The requirement for the Abstract was, under the circumstances here, for such an abstract and with such a form of Certificate as was customary to the knowledge of Mr. B. to be furnished by the Registrar of X. and the abstract as furnished was satisfactory to Mr. B. who acted for Mr. L. in giving the order.

2. The solicitors in effect complain that words have been added to the form of the Certificate of an Abstract given in subsection 2 of section 19. I take that subsection to be directory and if the party ordering the abstract is content to have it qualified then it may be qualified as noted in this case but a Registrar should not add these words to the form of certificate unless the party who orders the Abstract understands that such words are to form part of the certificate and is satisfied therewith.

3. Unless the patent from the Crown has been registered in full the only information the Registrar would in most cases have regarding it would be a notice from the Crown Department showing that a Patent had been issued and merely giving the date and name of the Grantee and the description of the land. It is common knowledge that a Registrar generally knows nothing about any conditions or provisoes contained in the patent and so also with regard to instruments which were registered by memorial.

4. Instruments first registered in this case must all have been registered by memorial. The Registrar could, of course, ascertain by reference to the memorials or copies, whether or not the memorials showed any conditions, limitations or provisoes, but memorials were not required to set out the conditions, limitations and provisoes in instruments of which they were memorials.

5. If the person receiving an abstract desires further information than is contained in it he has a right to require the abstract to be added to or extended so as to give such further particulars regarding registered instruments as the records show whether these consist of notice of Patent, memorials or instruments registered in full, and wherever they enable him to furnish such particulars and add to or extend the Abstract accordingly.

6. The Registrar may at some risk to himself, but I think should not make out the Abstract merely by making what would be nothing more than a copy of the Abstract Index. He should prepare the Abstract after reference to the copies of the instruments in the Registry Books. The Abstract Indexes especially in former days, sometimes did not give as full descriptions of the property conveyed by the instruments, especially where the part conveyed was only a portion of an original lot, as they ought to have done; indeed, not infrequently the descriptions of the properties in the instruments themselves were indefinite or incomplete. Then again the Indexes often omitted to refer or call attention to special clauses, conditions, limitations or provisoes in the instruments. Sometimes also they did not give the names of all the parties to the instruments. The Registrar, therefore,



should for his own protection as well as for the more efficient and satisfactory performance of his duties, in preparing an abstract refer to and examine the copies of the instruments themselves and not depend on the Abstract Index for particulars as to the contents of documents.

7. The Abstract would better have given or set out a description of the 10 acres of the lot referred to in instrument No. 1926, and if the same description was followed in subsequent instrument affecting the 10 acres some reference would better have been made to the effect that the description was the same as in instrument No. 1926. One would infer from the chain of title that the subsequent descriptions of the 10 acres were the same as the description contained in instrument 1926, but I think it is nowhere expressly stated that such descriptions were the same.

8. I think the Registrar should hereafter in furnishing abstracts head them in the form of subsection 2 of section 19, omitting the qualifying note which has been objected to by the Solicitors, but he may, and should where an instrument is registered by an original or a duplicate original, state or refer to any special condition, clause, limitation or charge contained in the instrument. I have frequently recommended in my Reports and otherwise that in the column for remarks in the Abstract Index the Registrar should call attention to any such special condition or clause in the instrument. If necessary the person who searches the title may then call for further information by way of addition to the abstract or he may make or have made a personal search with regard to such instrument.

9. With respect to Patents the Registrar may hereafter in cases where the Patent is not registered simply refer to the "Notice of Patent" and give such particulars as the Notice contains; and in the column for remarks the Registrar may, I think, call attention to the fact that the Patent itself has not been registered.

10. While a fuller Registrar's abstract could be furnished than is usually furnished in this Province containing more details and particulars of registered instruments and one more in the nature of what is known as a Solicitor's abstract, usual in England; there would probably be objection taken to paying the Registrar the fees for such fuller abstract. In this country a Registrar's abstract does not usually contain and is not expected to contain as many details as a Solicitor's abstract. The Registrar's abstract commonly in Ontario furnished in abbreviated form, answers most purposes connected with the transaction of business; and is supplied at less expense than would be involved in having an abstract made out in more extended form and giving fuller particulars.

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32. A CERTIFICATE OF DISCHARGE OF MORTGAGE SIGNED BY THREE OUT OF FOUR EXECUTORS OF MORTGAGEE MAY BE REGISTERED.

A question in difference touching the registration of a Certificate of Discharge of Mortgage has been submitted to me by the Deputy Registrar of X. I have had the advantage of hearing the views of the Solicitor, who tendered the Discharge of Mortgage for registration.

Briefly the question in this. Mr. R. a mortgagee, died leaving four executors. A certificate of Discharge of Mortgage has been presented for registration signed by 3 of his executors. The Registrar has declined to register the discharge on the ground that he thinks it must be executed by all the executors.

A Mortgage debt due to the testator is not different so far as it is a debt, from any other debt due to the testator. Although it is secured by a mortgage on lands it is still a debt. It is well settled that ordinarily the payment of a debt due to a Testator may be validly made to one or more of several executors and that such payment will discharge the debt; and in my opinion payment to one or more of such executors of a debt secured by a mortgage made to the Testator is a valid payment of such Mortgage debt, and such debt is thereby satisfied. I am not here speaking of a case of mortgage held by Trustees. One executor, therefore, may sign a Discharge certifying to the payment to himself of the Mortgage debt and stating that he is the person entitled by law to receive the mortgage money. The only question remaining is largely a technical one, as to whether such Certificate of Discharge will operate as a re-conveyance of the estate in the land which was held as security for the debt. I am of opinion that it will have such operation, and I think that this is so is made clear or confirmed by section 8 of the Devolution of Estates Act. I consider that section applies in such a case as the one now under consideration. The effect of that section seems to be as regards the lands mortgaged, to declare that the interest of the mortgagee in such lands is to be deemed personal estate and to expressly provide, amongst other things, that one only of several joint executors shall have the like powers to dispose of and otherwise deal with the land mortgaged as if it was personal estate vesting in the executors.

I may observe that the Registry books will show by whom the Discharge of Mortgage has been signed, and it will be for persons searching the title to satisfy themselves as to the validity of the Discharge.

I recommend the Registrar to treat the Discharge as *prima facie* sufficient for registration.

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33. AN ADMINISTRATOR OF THE ESTATE OF A MORTGAGEE APPOINTED BY A SURROGATE COURT IN ANOTHER PROVINCE IS NOT COMPETENT TO SIGN A VALID DISCHARGE OF A MORTGAGE COVERING LAND IN ONTARIO UNLESS ANCILLARY LETTERS OF ADMINISTRATION HAVE BEEN OBTAINED IN THIS PROVINCE.

To a Registrar:

*Re C. Discharge.*

I have considered the Discharge of Mortgage sent to you for registration purporting to be executed by C. of the Province of Saskatchewan and described as administrator appointed by the Court there of the estate of J. C. deceased, and I have to observe as follows :

Unless ancillary Letters of Administration have been or shall be obtained in this Province under section 74 of our Surrogate Courts Act, I do not think that the administrator appointed by the Surrogate Court in Saskatchewan is competent to give a valid discharge of this Mortgage, which is a mortgage made in Ontario and covers real property in Ontario.

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34. NOTICE OF EXPROPRIATION OF LANDS FOR CANAL UNDER DOMINION EXPROPRIATION ACT MAY BE PLACED ON RECORD AND NOTED IN ABSTRACT INDEX. AFFIDAVIT OF EXECUTION OF NOTICE NOT REQUIRED.

To a Registrar:

I return copy of an Expropriation Notice in connection with the new Canal, received with your letter of 30 Ultio. I have to observe as follows:

1. This notice appears to be deposited on record in your office under section 8 of the Expropriation Act, chapter 143, Revised Statutes of Canada. You may also refer to some of the sections immediately following section 8. It does not appear to require an affidavit of execution by the Engineer or Surveyor.

2. The Expropriation Act does not definitely say that the instrument is to be deemed to be registered, but I think, on the whole, it is proper to treat it as a registered instrument, as the affect of it appears to be virtually to take or expropriate the land for the benefit of the Crown.

3. I think it is expedient for you to continue the practice you speak of, to note the conveyance of a highway or notice of expropriation of a highway in the Index of the lots which front on the closed highway or part of highway so closed. It is only proper surely that Notice should be given to subsequent purchasers or mortgagees of these lots of the fact of the closing or Expropriation of the highway.

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## APPENDIX

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FEES AND EMOLUMENTS received by the Registrars of Deeds for the Province of Ontario for which are contrasted the amount of Fees, Surplus to Municipalities

### SCHEDULE A.

No. of Registration Division.	Name of Registration Division.	Name of Registrar.	No. of Municipalities.	Total No. of instruments registered in 1912.	Instruments registered in 1913.				
					Total number.	Fees therefor.	Uncopied.	Copied but uncom- pared.	
									1
1	Algoma	C. F. Farewell	12	3,906	3,142	\$ 4,205 52	1		
2	Brant	A. Graham	7	3,314	3,307	3,827 15			
3	Bruce	Wm. H. McFarlane	28	460	3,023	3,490 20			
4	Carleton	P. J. Coffey	12	3,627	3,701	4,972 86	398		
5	Dufferin	R. Johnston Dillen	9	1,287	1,134	1,318 05			
6	Dundas	D. J. Hunter	8	1,114	1,141	1,268 65	10		
7	Durham, East	Henry Elliott	5	842	769	106 84	75		
8	Durham, West	S. Pollard	5	819	861	1,112 10	10		
9	Elgin	James H. Coyne	15	4,087	4,172	4,815 15	42		
10	Essex	J. Wallace Askin	25	7,832	9,682	12,127 00	17		
11	Frontenac	John Gibson	18	1,403	1,446	1,822 65			
12	Glengarry	John Simpson	8	1,007	1,373	1,631 10			
13	Grenville	John Hollingsworth	9	910	1,070	1,623 05			
14	Grey, North	Robert McKnight	14	2,215	2,409	2,691 65			
15	Grey, South	M. K. Richardson	11	1,813	1,927	2,205 20	40	50	
16	Haldimand	Philip Ross Howard	14	1,806	1,939	2,465 80			
17	Haliburton	E. C. Young	23	325	292	372 95	4	4	
		Myrtle B. Field, Jan. to Mar. 3	0	2,127	343	531 25	22		
		Myrtle B. Field, Mar. 6 to May 6			452	519 40			
18	Halton	Victor Chisholm, May 6 to Dec. 31st							
19	Hastings	Samuel Russell	32	3,739	3,477	4,327 20	28	149	
20	Huron	William Coats	25	3,630	3,557	3,968 72			
21	Kingston, City	J. P. Gildersleeve	1	1,548	1,998	2,431 70	174		
22	Kent	P. D. McKellar	20	6,110	5,559	6,458 32	36		
23	Kenora	R. E. Preston	1	236	247	295 00			
24	Lambton	A. MacLean	21	4,658	4,888	5,477 30	99		
25	Lanark, North	P. C. McGregor	10	675	735	868 35			
26	Lanark, South	James Armour	9	2,450	2,079	1,559 75			
27	Leeds	Wilmot H. Cole	16	2,176	2,209	2,629 92			
28	Lennox and Addington	James Reid	17	1,276	1,356	1,647 70	29		
29	Lincoln	Carl E. Fisher	14	4,215	4,123	5,329 07	295		
30	London, City	R. H. Dignan	1	3,169	3,607	3,917 40			
31	Manitowlin	Warren R. Abrey	53	564	556	705 23	14	14	
32	Middlesex, North and East	James H. Marshall	13	3,583	3,117	3,697 17			
33	Middlesex, West	Richard Dunlop	9	1,171	1,160	1,379 95			
34	Muskoka	John E. Lount	27	1,165	1,172	1,507 70	68		
35	Norfolk	William E. Tisdale	13	3,260	3,086	4,594 55			
36	Northumberland, East	Arthur G. Willoughby	9	1,467	1,431	1,690 10	37		
37	Northumberland, West	Frances W. Field	5	892	837	1,079 25			
38	Nipissing	John M. Deacon	15	1,819	1,647	1,919 00			
39	Ontario	Geo. W. Dryden	17	3,288	3,126	3,786 20	31	13	
40	Ottawa	Joseph P. Fisher	1	7,973	6,268	7,270 55	169		
41	Oxford	George R. Pattullo	17	3,600	3,350	3,969 15	914		
42	Parry Sound	Charles Gillespie	52	1,085	980	1,288 00			
43	Peel	Samuel Charters	8	2,041	2,641	2,825 82	209		
44	Perth, North	James Steele	9	2,495	2,732	3,121 55			
45	Perth, South	Henry F. Sharp	7	980	1,095	1,150 00	55	41	
46	Peterborough	Bernard Morrow	19	2,733	3,235	4,161 04	182	16	
47	Prescott	Fred. W. Thistlethwaite	10	1,673	1,701	2,083 70	110		
48	Prince Edward	Walter Mackenzie	10	1,137	1,132	1,327 50	370	5	
49	Rainy River	Walter John K.	12	35	37	43 55	6		
50	Renfrew	Robert A. Campbell	43	2,443	2,813	3,806 66			
51	Russell	W. H. Lowrie	6	1,626	1,231	1,859 90			
52	Simcoe	John Ferguson Palling	29	6,822	6,351	7,852 04	290		
53	Stormont	John C. Alquire	6	1,387	1,345	1,538 75			
54	Sudbury	Stephen Fournier	23	671	819	1,098 58			
55	Thunder Bay	John Malcolm Munro	33	9,011	9,102	12,439 82			
56	Toronto, East	Peter Ryan	1	24,657	26,223	30,245 55	457	180	
57	Toronto, West	Robert Heber Bowes	1	28,693	25,921	29,854 85	524	101	
58	Victoria	Charles D. Barr	19	1,744	1,838	2,234 80	73		
59	Waterloo	John D. Moore	13	5,732	6,240	7,749 70	260		
60	Welland	Judson C. Crow	16	5,381	6,532	8,531 24	5,287		
61	Wellington, North	James Tucker	11	1,305	1,329	1,543 32	90	50	
62	Wellington South and Centre	Henry Horton	11	2,624	2,585	3,156 25	17	104	
63	Wentworth	Robert Knight Hope	11	18,024	15,890	18,654 07			
64	York, East and West	William J. Hill	14	14,721	14,516	18,519 56	326		
65	York, North	James D. McKay	10	1,906	2,029	2,971 95	74	264	
					952	239 48	241,280	290,777 66	11,140 1,107

the year 1913, made in accordance with the provisions of R.S.O., 1897, cap. 136, sec. 124, with and Registrars' income for the years 1911 and 1912.

## SCHEDULE A.

Patents.		Deeds.		Mortgages.		Dis. of Mortgages.		Wills.		Leases.		No. of Registration Division.
No. registered.	Fees for same.	No. registered.	Fees for same.	No registered.	Fees for same.	No. registered.	Fees for same.	No. registered.	Fees for same.	No. registered.	Fees for same.	
6	7	8	9	10	11	12	13	14	15	16	17	
	\$ c.		\$ c.		\$ c.		\$ c.		\$ c.		\$ c.	
4	8 10	1,531	2,349 25	556	739 05	492	271 35	39	77 10	2		1
1,393		2,083 00	850	872 65	712	403 90	76	133 30	3 10	9	12 80	2
1	1 40	1,084	1,623 85	685	712 40	809	495 05	154	317 10	2	4 55	3
1,724		2,766 05	859	917 79	659	560 28	92	180 60	13 50	7	4 35	4
1	1 40	409	638 90	265	274 75	304	178 15	50	99 45	2	6 40	5
424		610 30	296	298 80	278	160 20	39	73 55	1 40	1	6 60	6
352		569 30	134	134 45	148	106 25	42	80 70	3 55	7	4 35	7
1		417	654 15	145	146 45	149	94 95	52	89 40	3	7 85	8
1,488		2,306 30	1,011	1,044 40	1,049	578 35	120	266 05	43	34 15	10	9
13	20 75	4,354	519 45	2,092	2,225 85	1,844	1,113 60	128	236 35	16	50 75	11
22	32 70	604	920 10	267	299 40	343	265 60	49	85 80	30	8 65	12
1	1 55	503	769 95	298	303 45	330	196 75	81	163 60	5	12 10	13
1	1 40	401	654 00	217	232 90	239	155 20	69	144 60	6	2 45	14
1		824	1,220 80	542	561 85	554	289 50	92	179 40	1	3 85	15
695		1,026 75	497	527 95	456	275 60	71	131 05	2	496 80	16	16
635		945 55	393	434 85	381	228 60	43	75 85	288			17
3	4 80	172	260 65	36	43 25	53	29 00	6	11 20			18
94		291 20	47	97 40	104	28 25	9	16 85				
176		258 55	142	143 65	99	64 65	10	18 75				
3	4 20	502	757 30	348	353 25	284	181 05	36	61 60			
12	16 75	1,602	2,371 75	706	730 00	577	380 20	149	276 50	21	37 55	19
1	1 40	1,216	1,817 32	836	845 25	946	547 65	240	395 65	7	14 05	20
1	1 70	859	1,286 35	540	548 40	394	316 10	53	81 15	3	6 10	21
1	1 40	2,000	3 030 04	1,242	1,260 65	1,338	712 45	156	250 35	205	319 96	22
125		175 25	37	37 40	30	15 00						23
1,902		2,764 35	1,149	1,171 85	1,169	607 70	122	192 20	62	94 65	24	24
298		450 25	146	153 90	160	97 10	53	90 20				25
1	1 40	542	562 70	308	327 10	292	180 00	41	53 05	2	4 15	26
6	9 00	839	1,214 52	514	521 40	533	319 70	107	186 55	12	19 50	27
576		987 00	271	299 30	346	217 35	72	120 65	2	3 10	28	
1,764		1,798 86	907	958 31	813	615 60	85	183 60	31	60 55	29	
1,274		1,899 35	929	933 30	883	469 20	114	187 20	8	19 50	30	
238		360 30	99	115 80	115	66 80	7	16 75	52	86 15	31	
1,238		1,866 05	697	716 45	743	417 22	126	312 45	40	58 15	32	
448		674 20	281	296 45	255	136 96	60	112 10	21	40 20	33	
621		928 65	149	153 70	202	110 45	43	91 85	2	4 25	34	
1,171		1,793 50	644	652 40	675	391 50	89	179 40	35	60 60	35	
540		897 35	290	302 15	356	229 95	57	91 95	11	19 15	36	
377		533 55	159	169 15	189	126 85	47	85 90	2	3 85	37	
759		1,000 30	371	379 85	265	160 15	10	13 00	8	14 05	38	
1,311		2,001 80	697	702 05	641	404 90	123	239 00	9	19 30	39	
2,165		3,543 35	1,718	1,734 55	1,500	16 00	138	226 80	10	26 40	40	
1,220		1,921 70	852	869 75	818	503 05	120	242 90	5	11 45	41	
518		800 95	159	176 75	168	94 40	15	35 30			42	
987		1,438 90	351	599 27	458	265 70	106	175 50	1	1 40	43	
1,068		1,591 95	683	722 75	652	377 95	91	154 00	2	7 45	44	
354		504 75	217	249 15	254	165 65	59	108 10			45	
1,298		2,196 45	780	807 70	697	119 19	93	188 45	1	14 45	46	
580		941 50	435	482 46	567	282 60	56	142 75	5	2 00	47	
429		656 20	257	266 35	51	138 35	63	108 50	5	9 35	48	
6	8 55	1,242	1,903 50	563	576 85	419	422 85	72	123 90	2	4 00	50
295		921 65	451	556 20	291	294 15	36	69 05	2	4 75	51	
2,789		4,273 11	1,382	1,440 77	1,413	905 50	192	353 95	8	19 40	52	
460		689 55	393	353 45	353	190 50	56	111 50	3	6 60	53	
296		631 06	171	194 57	191	53 40	9	14 00	4	6 05	54	
1	1 70	4,429	6,688 24	1,089	1,185 82	1,031	517 37	31	61 25	3	6 15	55
8,241		13,675 50	8,369	8,440 45	4,808	2,494 25	2	4 45	154	456 50	56	
7,642		12,650 20	7,896	7,952 25	5,077	2,835 40	472	922 45	13	38 95	57	
709		1,184 20	384	405 30	470	300 95	68	151 45	4	11 73	58	
2,652		4,276 50	1,569	1,576 30	1,198	709 50	178	333 40	3	7 95	59	
3,105		4,667 60	1,387	1,479 70	1,131	700 30	134	227 65	88	119 85	60	
439		671 55	329	347 87	313	215 40	89	150 10			61	
990		1,560 10	614	627 80	563	349 50	114	211 45	5	11 45	62	
5,835		9,318 22	4,773	4,866 27	3,074	1,725 80	249	409 40	44	87 55	63	
5,569		9,002 74	4,001	4,133 40	2,193	1,906 30	144	255 25	9	23 80	64	
524		1,229 70	511	526 66	397	260 71	66	112 15	4	11 45	65	
140	27 113	91,608	137,620 40	59,992	62,208 73	48,625	28,078 93	5,668	10,495 85	1,326	2,536 98	

## Fees and Emoluments received by the Registrars

## Schedule A.—Continued.

No. of Registration Division.	Name of Registrar.	Abstracts.		Searches.		Mechanics' Liens.		All other instruments registered.	
		Number.	Fees for same.	Number.	Fees for same.	Number.	Fees for same.	Number.	Fees for same.
		18	19	20	21	22	23	24	25
1	O. F. Farewell.....	341	\$ c. 339 40	437	\$ c. 556 79	113	\$ c. 99 55	408	\$ c. 658 02
2	Alex. Graham.....	66	90 75	1,358	476 90	33	9 20	231	658 02
3	Wm. H. McFarlane.....	638	554 80	879	219 45	3	75	289	312 80
4	Patrick J. Coffey.....	252	331 30	1,887	879 00	11	4 75	351	335 10
5	David J. Hunter.....	150	170 00	294	149 45	1	25	99	529 89
6	R. Johnston Dillen.....	21	29 70	192	78 80	2	1 00	104	118 55
7	Henry Elliott.....	118	174 10	374	218 45	6	2 75	78	124 40
8	Samuel Pollard.....	152	171 20	797	295 77	.....	.....	103	109 80
9	James H. Coyne.....	95	208 25	2,464	675 70	19	8 35	441	122 80
10	J. Wallace Askin, per P. G. Smily, Dep. Registrar.....	142	188 25	5,134	2,562 10	30	13 45	1,105	536 85
11	J. Gibson—Number of Abstracts.....	51	72 00	1,003	251 25	9	2 70	122	19 63
12	No. of Productions, Copies, etc.....	1,006	134 20	.....	.....	.....	.....	.....	165 60
13	John Simpson.....	196	354 75	664	170 80	12	3 95	144	184 75
14	John Hollingsworth.....	36	72 55	295	95 10	.....	.....	137	162 05
15	Robert McKnight.....	379	322 60	971	294 55	2	50	384	537 00
16	M. K. Richardson.....	431	343 15	401	100 25	1	25	205	235 35
17	Philip Ross Howard.....	297	332 35	627	374 75	.....	.....	179	284 15
18	Ephraim C. Young.....	51	46 80	208	55 25	.....	.....	22	24 05
19	Myrtle B. Field (Deputy Registrar).....	30	66 90	300	166 30	1	25	38	57 30
20	Myrtle B. Field (Deputy Registrar).....	111	58 10	192	147 50	4	1 10	21	32 70
21	Victor Chisholm.....	174	126 70	546	381 90	9	2 25	100	152 66
22	Samuel Russell.....	464	637 35	2,181	669 15	22	11 80	388	502 65
23	William Coats.....	801	670 50	1,069	315 65	7	3 40	304	505 55
24	J. P. Gildersleeve.....	41	85 20	1,158	576 85	14	3 85	134	344 00
25	P. D. McKellar.....	373	532 20	1,506	572 05	7	2 25	610	188 20
26	R. E. Preston.....	13	17 70	52	28 45	4	1 00	51	81 05
27	Archibald MacLean.....	224	136 90	3,065	913 35	8	2 25	469	66 35
28	Peter C. McGregor.....	116	106 20	359	100 00	2	50	76	631 80
29	James Armour.....	164	74 90	585	216 40	.....	.....	144	76 30
30	Wilmot H. Cole.....	156	236 75	1,604	417 60	3	75	195	140 05
31	James Reed.....	63	115 90	914	264 00	.....	.....	89	258 50
32	Carl E. Fisher.....	910	1,638 55	1,903	1,001 70	21	6 80	502	110 30
33	Ralph H. Dignan.....	53	177 90	1,526	598 85	36	8 50	363	705 35
34	Warren R. Abrey.....	47	55 85	643	161 85	1	25	35	400 35
35	James H. Marshall.....	173	244 25	940	378 95	7	3 00	266	38 20
36	Richard Dunlop.....	213	255 35	335	155 10	.....	.....	95	323 35
37	John E. Lount.....	115	123 30	1,000	282 75	4	2 30	144	123 10
38	William E. Tisdale.....	276	356 65	1,838	567 90	25	18 65	445	205 50
39	Arthur G. Willoughby.....	359	392 15	293	99 35	.....	.....	177	571 15
40	Frances W. Field.....	206	343 15	546	196 55	1	2 00	122	209 55
41	John M. Deacon.....	136	141 45	1,380	301 10	19	5 50	215	157 95
42	George W. Dryden.....	359	645 70	1,201	427 55	14	3 60	331	250 15
43	Joseph G. Fisher.....	789	747 00	5,080	1,270 00	80	20 10	647	415 55
44	George R. Pattulo.....	476	557 95	1,562	424 70	5	1 25	330	94 80
45	Charles Gillespie.....	139	187 00	1,228	307 00	2	90	109	419 05
46	Samuel Charters.....	88	170 10	341	125 45	10	2 50	135	164 35
47	James Steele.....	263	257 85	1,060	281 85	8	7 85	228	98 75
48	Henry F. Sharp.....	188	154 05	393	98 25	.....	.....	90	264 60
49	Bernard Morrow.....	170	342 30	1,789	869 90	9	2 85	350	112 75
50	Fred. Thistlethwaite.....	119	183 70	488	232 60	.....	.....	152	527 74
51	Walter MacKenzie.....	33	33 25	416	131 45	4	1 25	12	224 45
52	Walter J. Keating.....	.....	.....	.....	.....	.....	.....	37	143 15
53	Robert A. Campbell.....	194	141 35	547	193 90	5	2 75	204	43 55
54	W. H. Lowrie.....	361	473 20	107	178 45	1	25	55	264 56
55	John Ferguson Palling.....	617	1,187 11	1,841	993 20	10	3 70	550	71 85
56	John C. Alquire.....	124	245 60	814	228 50	1	25	139	779 93
57	Stephen Pournier.....	163	168 95	331	144 75	28	11 50	110	186 90
58	John Malcolm Munro.....	795	1,311 60	5,372	2,978 75	63	23 65	2,655	180 00
59	Peter Ryan.....	661	1,888 15	18,307	6,753 45	365	104 95	4,284	3,955 64
60	Robert Heber Bowes.....	500	1,223 50	33,953	8,463 50	298	78 80	4,521	4,869 45
61	Charles D. Barr.....	87	158 10	1,461	423 35	2	50	199	5,373 40
62	John D. Moore.....	263	271 90	893	415 45	89	35 90	551	277 85
63	Judson C. Crow.....	931	1,408 90	3,514	907 50	44	16 35	638	801 15
64	James Tucker.....	335	376 55	247	166 00	2	50	128	1,282 49
65	Henry Hortop.....	159	291 70	1,922	654 45	14	3 50	285	157 90
66	Robert Knight Hope.....	2,383	4,236 40	7,694	3,118 25	140	41 85	1,774	392 45
67	William J. Hill.....	294	887 55	11,337	4,545 70	151	38 90	2,443	2,303 43
68	James D. McKay.....	202	366 40	638	388 35	7	2 15	215	3,676 17
Totals.....		20,333	28,445 91	144,386	50,729 66	1,789	624 65	30,665	27,396 50



of Deeds for the Province of Ontario, etc.—Continued.

## Schedule A.—Continued.

Received for work done for municipalities.	From other sources not enumerated.	Fees earned and not received.	Gross amount of fees earned for the year 1913.	Gross amount for 1912.	Gross amount for 1911.	Amount paid Deputy Registrars for services.	Other charges in connection with office.	No. of Registration Division.
26	27	28	29	30	30a	31	31a	
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	
.....	.....	.....	5,310 89	7,441 16	5,744 89	755 00	1,097 30	1
.....	52 80	600 00	4,447 60	4,595 60	4,309 15	.....	.....	2
.....	60 30	640 16	4,324 75	4,712 50	4,875 80	1,300 00	639 37	3
591 40	77 05	94 00	6,260 21	6,991 59	6,068 88	1,720 00	1,278 00	4
655 90	32 75	.....	1,670 25	1,886 25	2,086 70	800 00	139 91	5
.....	20 45	.....	1,397 60	1,402 25	1,483 20	550 00	20 00	6
.....	.....	253 10	1,405 20	1,636 00	1,607 65	702 60	15 00	7
.....	19 35	452 86	1,598 42	1,875 20	1,483 22	550 00	16 00	8
1,170 95	118 50	185 01	5,821 90	5,672 50	5,922 95	1,221 50	109 71	9
.....	137 85	.....	15,015 20	11,846 26	9,271 60	1,414 00	2,954 61	10
.....	.....	.....	2,280 10	2,465 85	1,908 60	350 00	136 45	11
.....	35 00	246 00	2,191 65	1,358 90	1,347 47	518 00	44 00	12
.....	93 00	79 80	1,623 05	1,359 90	1,194 75	720 00	150 00	13
.....	.....	390 00	3,357 30	4,130 55	4,964 40	600 00	455 60	14
20 40	52 75	206 86	2,701 35	2,582 95	2,717 40	845 00	482 00	15
.....	34 00	331 01	3,206 90	2,860 15	2,317 82	900 00	547 62	16
.....	26 55	.....	501 55	575 90	534 50	.....	.....	17
.....	16 45	23 16	780 90	3,761 50	3,530 50	119 00	105 18	18
.....	10 70	347 35	735 70	.....	.....	.....	57 92	19
.....	68 80	81 51	2,089 71	.....	.....	399 36	247 75	20
.....	81 70	647 27	5,715 40	6,363 23	6,266 60	13 50	865 93	21
.....	.....	853 65	4,954 87	5,105 95	5,002 75	800 00	1,050 55	22
85 25	.....	.....	3,093 75	2,393 85	1,683 78	.....	511 57	23
.....	262 50	693 96	7,825 07	8,687 80	7,363 47	1,600 00	1,459 78	24
.....	1 75	.....	342 90	324 18	289 75	100 00	11 00	25
650 00	64 10	361 55	6,591 65	6,246 35	5,022 00	1,310 00	1,803 70	26
.....	14 75	.....	1,089 90	986 55	938 35	78 90	.....	27
.....	.....	.....	1,559 75	2,183 85	1,836 50	100 00	.....	28
.....	93 05	27 30	3,377 32	3,454 25	2,967 25	1,300 00	291 00	29
.....	82 50	109 78	2,110 10	2,698 90	2,373 95	800 00	415 00	30
281 90	702 61	767 11	8,671 93	8,263 35	6,414 37	806 00	1,055 21	31
67 55	.....	.....	4,839 50	4,121 70	3,509 15	416 00	60 00	32
.....	40 00	30 00	962 93	976 73	838 36	300 00	20 50	33
27 60	102 14	.....	4,422 30	3,718 76	3,574 60	1,295 00	264 50	34
.....	67 45	20 00	1,857 85	1,665 75	1,559 15	550 00	22 00	35
.....	176 45	30 00	2,090 20	2,215 55	2,273 40	600 00	100 00	36
.....	33 10	.....	4,627 65	4,810 85	5,024 25	914 00	540 00	37
383 00	264 40	121 44	2,446 00	2,760 10	2,673 85	520 00	155 00	38
.....	26 65	377 98	1,639 50	2,106 15	1,488 45	540 00	149 00	39
.....	.....	.....	2,361 55	3,011 71	1,862 55	784 00	.....	40
.....	121 45	.....	4,980 90	6,204 29	4,187 80	1,040 00	884 56	41
107 75	1,396 95	4 55	10,769 05	13,981 59	13,446 29	3,300 20	1,441 00	42
.....	271 70	.....	5,223 50	5,351 10	4,884 35	900 00	716 63	43
.....	117 55	100 50	1,899 55	2,325 80	1,474 10	410 00	10 00	44
50 00	10 25	.....	2,885 82	2,334 65	2,136 20	700 00	3 60	45
.....	71 00	.....	3,732 25	3,341 35	3,177 15	475 00	589 89	46
.....	.....	42 05	1,493 75	1,418 15	1,387 95	520 00	.....	47
.....	.....	.....	5,496 29	4,401 61	4,348 23	1,450 00	330 00	48
.....	192 55	100 00	2,692 55	2,459 35	2,177 35	600 00	352 00	49
.....	9 60	60 70	1,502 10	1,631 05	1,516 50	600 00	.....	50
.....	5 05	.....	48 60	45 60	43 85	.....	.....	51
.....	46 80	25 45	3,632 71	3,430 98	2,567 45	467 00	462 80	52
.....	187 95	24 80	2,669 50	2,946 15	2,711 35	600 00	367 00	53
.....	22 30	1,146 40	10,054 65	11,360 70	9,202 77	1,500 00	2,834 63	54
.....	68 00	60 60	2,080 85	2,061 75	1,832 75	549 00	24 50	55
.....	8 70	28 35	1,412 98	1,052 59	814 71	600 00	.....	56
419 70	.....	.....	17,149 87	9,262 22	9,263 22	1,967 50	7,033 82	57
.....	.....	.....	38,887 15	37,637 75	28,175 80	3,732 00	13,488 00	58
.....	.....	.....	39,541 85	42,600 95	35,898 40	5,137 00	15,029 00	59
.....	97 25	10 60	3,013 50	2,741 55	3,217 00	600 00	749 60	60
.....	33 05	1,628 05	8,461 10	7,564 45	6,295 00	1,500 00	1,663 57	61
.....	198 05	1,613 31	11,045 69	8,857 85	7,836 16	1,000 00	2,078 98	62
.....	36 75	4 00	2,122 62	1,993 80	2,192 10	600 00	154 50	63
.....	79 70	.....	4,182 10	3,973 15	3,724 35	520 00	648 00	64
.....	24 00	1,551 89	26,008 72	31,045 38	23,501 73	3,000 40	8,046 00	65
2,782 64	322 24	.....	24,275 05	24,816 81	18,206 08	2,080 00	6,552 97	66
394 90	.....	140 23	3,112 18	2,333 30	2,921 46	562 00	366 20	67
7,269 24	6,609 64	14,512 64	375,675 23	378,538 34	323,307 13	60,701 96	81,898 41	

## Fees and Emoluments received by the Registrars

## Schedule A.—Continued.

No. of Registration Division.	Name of Registrar.	Surplus of gross income to municipality under sec. 126, cap. 136, R.S.O., 1897.				Surplus of net income to municipality under ss. 126 and 127, cap. 136, R.S.O., 1897.			
		Amount for 1913.	When paid and to whom paid.	Amount for 1912.	Amount for 1911.	Amount for 1913.	When paid and to whom paid.	Amount for 1912.	Amount for 1911.
		\$ c.	32a	\$ c.	\$ c.	\$ c.	35	\$ c.	\$ c.
1	C. F. Farewell .....		City Treas.				City Treasurer		
2	Alexander Graham.....	434 28	Jan. 12, 1914	488 25	392 70	92 96	Jan. 12, 1914	110 05	103 20
			N. Robertson				Norman Robertson,		
3	Wm. H. McFarlane.....	397 43	Jan. 2, 1914	584 30	600 32	48 80	Jan. 2, 1914	197 22	191 29
4	Patrick J. Coffey.....	1,154 08	Jan. 14, 1914	1,422 67	1,077 50	21 62	Jan. 14, 1914	276 90	259 53
5	David J. Hunter.....		County Treas.				Co. Treasurer		
6	R. Johnston Dillen.....		County Treas.				Co. Treasurer		
7	Henry Elliott.....		Jan. 14, 1914				Jan. 14, 1914		
8	Samuel Poulard.....		County Treas.				Co. Treasurer		
9	James H. Coyne.....	905 13	Jan. 14, 1914	919 87	1,019 70	300 75	Jan. 14, 1914	304 68	361 14
			Prov'l Treas.				Prov'l Treas.		
10	J. Wallace Askin.....	4,656 08	Jan. 15, 1914	3,388 50	2,358 64	1,798 80	Jan. 15, 1914	1,301 52	895 11
			Co., City of Windsor, T'n of Walkerville				Co. Windsor, Walkerville		
11	John Gibson.....		Treasurers			29 35	Jan. 14, 1914	64 57	10 40
			County Treas.				County Treas.		
12	John Simpson.....		Jan. 14, 1914			12 95	Jan. 14, 1914		
13	John Hollingsworth.....		Stormont, Dundas, Glen-				Stormont, Dundas, Glen-		
			garry, Treas.				garry, Treas.		
14	Robert McKnight.. ..	121 46	Jan. 15, 1914	554 2	597 20	77 52	Jan. 15, 1914	150 53	183 59
			County Treas.				Co. Treasurer		
15	Matthew K. Richardson	2 14	Jan. 13 Feb. 13	8 2	21 74		Jan. 13, 1914		
			Jan. 14, 1914				Jan. 14, 1914		
16	Philip Ross Howard...	91 38	Jan. 14, 1914	3 41	4 23	25 92	Jan. 13, 1914	39 24	
17	Edmund C. Young.....		T. Snider, Co. Treasurer				T. Snider, Co. Treasurer		
18	Myrtle B. Field, D.Reg.		County Treas.				County Treas.		
19	Myrtle B. Field, D.Reg.		County Treas.				County Treas.		
20	Victor Chisholm.....	181 89	Jan. 24, 1914	228 45	150 00	149 04	Jan. 24, 1914	199 65	198 60
			Treas. Co.				Co., Belleville and Trenton,		
21	Samuel Russell.....	936 16	Jan. 13, 1914	1,195 29	1,156 64	108 99	Jan. 13, 1914	239 54	244 04
			Trenton				Treasurer		
22	William Coates.....	631 95	Jan. 8, 1914	692 38	651 10	144 48	Jan. 8, 1914	183 76	169 23
			Treas. City Kingston				Treasurer City Kingston		
23	James P. Gildersleeve..	60 89	Jan. 15, 1914			146 39	Jan. 15, 1914	53 83	
24	Peter D. McKellar.....	1,780 02		2,125 12	1,595 38	295 58		320 09	293 55
25	Robert E. Preston.....		Henry Ingram				Hy. Ingram,		
			Co. Treas.				County Treas.		
26	Archibald MacLean ...	1,286 66	Jan. 9, 1914	1,148 54	658 80	88 25	Jan. 9, 1914	150 54	114 56
27	Peter C. McGregor.....		County Treas.				County Treas.		
28	James Armour.....		County Treas.				County Treas.		
29	Wilmot H. Cole.....	125 46	Jan. 7, 1914	140 85	46 70	16 08	Jan. 7, 1914	45 74	26 75
30	James Reid.....		D. Wisner, Treasurer				D. Wisner Treasurer		
31	Carl E. Fisher.....	2,118 97	Jan. 20, 1914	1,955 64	1,265 75	1,145 98	Jan. 20, 1914	1,126 58	655 76
			City Treas.				City Treas.		
32	Ralph H. Dignan.....	668 58	Jan. 14, 1914	320 43	142 44	558 78	Jan. 14, 1914	425 32	324 02
33	Warren R. Abrey.....		County and City Treas.				County and City Treasurer		
34	Jos. H. Marshall.....	366 30	January, 1914	215 63	8 26	149 40	January, 1914	102 14	

## of Deeds for the Province of Ontario, etc.—Continued.

Schedule A.—Continued.			Schedule B.						
Net amount received by Registrar.			Number and aggregate amount of mortgages registered.						
Amount for 1913.	Amount for 1912.	Amount for 1911.	For nominal consideration or amount not specified.	For \$1,000 or under.	Over \$1,000 and not exceeding \$2,000.	Over \$2,000 and not exceeding \$5,000.	Over \$5,000.	Total number.	Aggregate amount.
37	37a	37b	Class I. 38	Class II. 38	Class III. 38	Class IV. 38	Class V. 38	39	40
\$ c.	\$ c.	\$ c.							\$ c.
3,458 59	5,997 11	4,596 61	16	344	198	61	27	553	1,382,104 40
2,120 36	2,190 20	2,103 25	11	384	289	129	37	850	1,384,801 00
1,939 15	2,016 97	2,446 34	5	288	185	190	17	685	1,234,769 71
2,677 91	3,421 02	2,605 60	14	453	227	139	26	859	1,449,553 94
730 44	922 81	1,095 02	8	118	72	60	7	265	418,751 00
827 60	957 00	1,083 20	7	125	78	76	10	296	465,495 00
687 60	785 00	727 52	7	71	29	24	7	131	190,934 00
1,032 42	1,286 05	957 52	.....	69	35	37	4	145	2,111,401 65
2,700 75	2,704 68	2,609 31	7	461	310	204	29	1,011	1,630,868 63
4,198 81	3,631 31	3,295 11	4	772	653	494	169	2,092	5,177,522 74
1,764 30	2,008 28	1,570 20	.....	167	87	65	8	267	600,707 02
1,616 70	942 90	919 47	.....	146	95	52	5	298	4,503 26
753 05	526 40	371 25	3	112	67	29	6	217	1,861,302 13
2,203 12	2,565 52	2,688 31	14	220	160	120	19	533	347,581 50
1,374 35	1,086 27	1,241 00	9	219	167	94	8	497	741,041 34
1,759 28	1,397 25	995 82	.....	177	119	53	44	393	670,956 33
501 55	575 20	514 50	.....	32	3	1	.....	36	20,751 23
.....	.....	.....	.....	31	19	23	7	80	180,825 00
.....	.....	.....	.....	39	36	34	14	123	333,153 85
1,257 32	762 53	2,463 40	2	96	20	65	20	273	710,215 56
2,394 32	2,558 91	2,569 41	5	436	134	112	19	706	368,995 95
2,327 89	2,428 76	2,394 87	16	313	233	249	25	836	1,547,879 21
2,374 90	1,965 33	1,397 98	1	252	158	104	25	540	1,121,473 00
2,689 71	2,720 10	2,837 96	2	651	284	279	75	1,311	2,960,751 48
231 90	213 18	178 75	2	22	4	2	7	37	44,197 68
2,753 04	2,351 37	2,208 22	20	579	282	217	20	1,118	1,602,177 63
1,011 00	886 43	829 10	8	97	22	18	1	146	183,369 74
1,459 75	1,508 85	1,436 50	5	131	98	68	6	308	622,106 92
1,644 78	1,911 80	1,740 80	3	239	137	121	14	514	787,919 37
895 10	1,464 01	1,255 95	2	110	87	69	3	271	421,076 12
3,545 97	3,517 58	3,055 76	7	271	294	252	83	907	2,319,214 99
3,136 14	2,878 95	2,569 69	6	129	316	144	34	929	1,574,743 87
600 00	656 23	468 54	.....	76	14	9	.....	89	81,445 78
2,347 30	2,150 11	2,476 00	4	141	174	174	44	629	1,495,207 82

No. of Registration Division.



## Fees and Emoluments received by the Registrars

## Schedule A.—Continued.

No. of Registration Division.	Name of Registrar.	Surplus of gross income to municipality under sec. 126, cap. 136, R.S.O., 1897.				Surplus of net income to municipality under ss. 126 and 127, cap. 136, R.S.O., 1897.			
		Amount for 1913.	When paid and to whom paid.	Amount for 1912.	Amount for 1911.	Amount for 1913.	When paid and to whom paid.	Amount for 1912.	Amount for 1911.
		32	32a	33	33a	34	35	36	36a
		\$ c.		\$ c.	\$ c.	\$ c.		\$ c.	\$ c.
33	Richard Dunlop.....								
34	John E. Lount.....								
35	Wm. E. Tisdale.....	351 06	County Treas. Jan. 15, 1914	574 34	659 70	246 77	County Treas. Jan. 15, 1914	271 35	283 36
36	Arthur G. Willoughby.....			26 01		27 10	County Treas. Jan. 14, 1914	51 13	20 99
37	Francis W. Field.....								
38	John M. Deacon.....								
39	George W. Dryden.....	642 36	County Treas. Jan. 15, 1914	1,131 71	356 34	32 79	County Treas. Jan. 15, 1914	127 27	89 36
40	Joseph P. Fisher.....	2,957 62	City Treasurer Jan. 14, 1914	4,242 63	4,028 52	335 12	City Treas. Jan. 14, 1914	1,192 65	1,202 57
41	George R. Pattulo.....		Co. Oxford City of Wood- stock, Treas.				Co. of Oxford City of Wood- stock, Treas.		
42	Charles Gillespie.....	765 75	Jan. 15, 1914	707 30	603 74	167 15	Jan. 15, 1914	192 24	143 34
43	Samuel Charters.....							8 61	
44	James Steele.....	219 66	County Treas. City Treasurer Jan. 15, 1914	118 27	85 43	129 60	Co. and City Treasurer Jan. 15, 1914	88 19	74 68
45	Henry F. Sharp.....								
46	Bernard Morrow.....	898 51		460 64	439 29	245 33		94 19	87 78
47	Fred. Thistlethwaite.....					53 30	Jan. 15, 1914	13 24	
48	Walter Mackenzie.....								
49	Walter J. Keating.....								
50	Robert A. Campbell....	189 81	T. Henderson January, 1914	136 20	6 75	153 74	T. Henderson, January, 1914	106 96	23 32
51	W. H. Lowrie.....	16 95		41 93	21 13	16 17		35 19	19 37
52	John Ferguson Palling.....	2,671 86	County Treas. Jan. 14, 1914		2,331 10	295 68	County Treas. Jan. 14, 1914	gross & inc 4,260 00	
53	John O. Alquire.....			20 59					
54	Stephen Fournier.....								
55	John Malcolm Munro.....	2,592 45							
56	Peter Ryan.....			8,129 48		15,900 45	Prov. Treas. Jan. 15, 1914	5,784 00	11,127 45
57	Robert H. Bowes.....					13,838 30	Prov. Treas. Jan. 15, 1914	19,455 25	15,654 85
58	Charles D. Barr.....	52 70	County Treas. Jan. 14, 1914	24 15	93 40	11 12	County Treas. Jan. 14, 1914		27 24
59	John Douglas Moore....	2,034 44	Co. and City Treasurer Dec. 31, 1913	1,675 78	1,168 00	431 55	Co. Welland and separate City of Niagara Falls, Treas. Dec. 31, 1914	328 77	143 95
60	Judson C. Crow.....	3,068 28	Co. Welland and separate City of Niagara Falls, Treas.	2,193 14	1,784 46	1,249 22	Co. Welland and separate City of Niagara Falls, Treas.	754 46	492 96
61	James Tucker.....								
62	Henry Hortop.....	354 63	County Treas. Jan. 12, 1914	291 95	131 38	207 84	County Treas. Jan. 12, 1914	119 96	71 93
63	Robert K. Hope.....					9,866 09	City \$7,321.46 Co... 2,544.63 Jan. 15, 1914	15,110 99	10,718 31
64	William J. Hill.....	8,560 00	Prov. Treas. Jan. 7, 1914	8,576 72	5,932 43	2,341 04	Prov. Treas. January 7	3,050 04	1,292 70
65	James D. McKay.....	47 19	County Treas. Jan. 15, 1914	24 99		58 75	County Treas. Jan. 15, 1914	34 54	
	Totals.....	41,460 13		58,887 39	29,399 53	56,160 39		56,200 51	45,304 93



of Deeds for the Province of Ontario, etc.—*Continued.*

Schedule A.— <i>Concluded.</i>			Schedule B.								No. of Registration Division.
Net amount received by Registrar.			Number and aggregate amount of mortgages registered.								
Amount for 1913.	Amount for 1912.	Amount for 1911.	For nominal consideration or amount not specified.	For \$1,000 or under.	Over \$1,000 and not exceeding \$2,000.	Over \$2,000 and not exceeding \$5,000.	Over \$5,000.	Total number.	Aggregate amount.		
37	37a	37b	Class I. 38	Class II. 38	Class III. 38	Class IV. 38	Class V. 38	39	40		
\$ c.	\$ c.	\$ c.							\$ c.		
1,285 85	1,080 75	1,174 15	2	132	75	64	5	281	341,725 45		
1,390 20	1,465 55	1,563 40	.....	120	16	8	5	149	142,151 33		
2,575 82	2,633 18	2,661 19	3	340	156	124	21	644	956,975 00		
1,743 90	1,960 21	1,709 95	4	148	84	51	3	290	397,041 81		
950 60	1,415 45	857 45	1	74	28	46	10	159	313,489 50		
1,000 00	1,000 00	1,000 00	7	196	88	60	20	371	569,312 37		
2,281 19	2,680 30	2,282 46	5	341	164	159	28	697	1,248,496 63		
2,842 86	3,742 82	3,753 5	19	588	396	519	196	1,718	6,289,120 00		
		2									
2,674 00	2,663 68	2,523 34	9	332	238	195	78	852	1,957,918 00		
1,479 55	1,577 44	718 60	.....	109	33	15	2	159	167,298 15		
1,825 82	1,364 65	1,186 20	3	176	219	135	60	593	1,058,204 38		
2,308 10	2,102 71	2,048 74	10	316	193	146	18	683	1,149,912 32		
973 75	898 15	948 55	5	69	62	94	17	247	495,628 00		
2,572 45	2,126 78	2,101 16	4	346	258	138	34	780	2,258,205 34		
1,787 25	1,619 11	1,471 60	3	214	114	89	17	435	697,630 72		
902 10	1,027 00	816 50	1	136	56	59	5	257	443,388 00		
48 60	45 60	43 85	.....	.....	.....	.....	.....	.....	.....		
2,359 36	2,426 84	1,734 22	13	314	125	94	17	563	795,413 75		
1,644 58	1,816 59	1,674 35	5	201	112	69	18	406	664,625 75		
2,752 48	2,284 81	2,929 38	17	758	342	220	54	1,382	2,054,464 20		
1,478 50	1,685 31	1,290 40	1	198	72	53	9	333	394,306 99		
812 98	462 59	384 71	1	66	43	43	18	171	8,394,662 81		
9,516 95	10,659 82	5,082 05	15	512	242	191	129	1,089	5,335,165 85		
5,766 70	5,784 00	5,236 35	3	.....	3,302	1,842	767	8,369	31,598,168 00		
5,537 55	6,161 70	5,739 40	80	2,357	3,030	1,968	458	7,896	18,244,779 00		
1,600 06	1,369 05	1,745 16	4	165	109	96	10	384	573,397 32		
2,831 54	2,728 76	2,325 80	6	591	601	299	72	1,569	2,362,683 28		
3,649 21	3,154 45	2,892 96	15	725	429	165	53	1,387	2,492,293 00		
1,368 10	1,242 80	1,027 10	5	99	108	98	19	329	655,429 00		
2,097 00	1,937 89	2,132 01	18	268	180	128	21	615	* 1,114,574 64		
5,096 23	5,678 99	5,190 92	31	2,256	1,392	845	249	4,773	32,202,088 00		
4,741 04	5,451 05	3,692 70	.....	1,602	1,428	735	241	4,007	113,360 26		
1,937 96	1,570 92	2,090 44	3	245	143	94	26	511	864,488 83		
140,847 38	144,835 28	129,792 57	480	22,108	18,904	12,665	3,514	60,125	161,874,476 40		

## INDEX

A.	
	PAGE
Abstract furnished by Registrar, Objections taken by solicitors to .....	42
Abstract furnished by Registrar, Observations on several points as to form and contents of .....	42
Abstract Index, Notice of Expropriation of lands for canal under Dominion Expropriation Act may be noted in .....	47
Administrator, of the estate of a mortgagee appointed by a Surrogate Court in another province is not competent to sign a valid discharge of a Mortgage covering land in Ontario unless Ancillary Letters of Administration have been obtained in this province .....	46
Affidavit of Execution, of Notice of Expropriation of lands for canal under Dominion Expropriation Act, not required .....	47
Affidavit of Execution, of an Instrument sworn before a Commissioner for taking affidavits for use in the Supreme Court of Judicature in England is sufficient without a certificate by the Commissioner that he has no official seal.....	26
Ancillary Letters of Administration, must be obtained by administrator of estate of a mortgagee appointed by a Surrogate Court in another province to be competent to sign a valid Discharge of Mortgage obtained in Ontario.....	46
Assent of Municipality, not necessary for registration of plan of a number of lots laid out for a summer resort and showing one private way or boulevard or place for recreation .....	13
Assignment of Mortgage, Mortgagor is competent witness to .....	28
Attorney, Powers of, old Discharges of Mortgage executed by Attorney may be registered without requiring registration of .....	38
B.	
Boulevard, see Plan .....	13
Business of a Registry Office, what are disbursements incident to .....	37
By-Laws, Money, observations regarding registration of after lapse of four weeks..	40
By-Laws, Money, what signatures of officials are necessary to authenticate copies of for registration .....	15
C.	
Canal, Notice of Expropriation of lands for under Dominion Expropriation Act may be placed on Record and noted in Abstract Index .....	47
Certificate of Discharge, may be given of a Derivative Mortgage .....	40
Certificate of Discharge, of Derivative Mortgage, effects of registration of.....	10
Certificate of Discharge, of Mortgage signed by the executors of the survivor of two joint mortgagees may be registered .....	41
Certificate of Discharge, of Mortgage signed by three out of four executors of mortgagee may be registered .....	45
Certified Copy of an Instrument, Registrar is entitled to charge for whether he makes such copy himself or whether such copy is made by another provided he has been requested to furnish such certified copy .....	8
Committee, See Lunatic .....	20
D.	
Deed, Tax, containing an indefinite or imperfect description erroneously or improperly registered against a lot may be disregarded by the Registrar in connection with the registration of a plan of subdivision of the land made for the person appearing by the Registry Books to be the owner of the lands.....	11
Deed, description in, of Railway Rights of Way .....	18
Declarations, Statutory, of explanations, cannot be registered .....	28
Derivative Mortgage, effects of registration of discharge of .....	10
Derivative Mortgage, Certificate of Discharge may be given of a.....	10
Description, imperfect or indefinite, in Tax Deed, erroneously or improperly registered against a lot .....	11
Description, in Deeds of Railway Rights of Way .....	18

	PAGE
Disbursements, what are, incident to the business of a Registry office.....	37
Discharge of Mortgage, executed by an assignee of the mortgage, and mortgage money and interest may be registered although the Assignment of Mortgage omits part of the lands covered by the mortgage .....	12
Discharge of Mortgage by a liquidator of a Company who were mortgagees.....	19
Discharge of Mortgage, observations <i>re</i> .....	28
Discharge of Mortgage, where executed by two out of three trustees who are not mortgagees, the document under which the new trustees claim interest in the mortgage should be registered, etc. ....	32
Discharge of Mortgage, where made by a number of trustees of a church and does not name all the trustees who were mortgagors if it clearly identifies the mortgage it is sufficient for registration .....	34
Discharge of Mortgage, where mortgage made to husband and wife as mortgagees .....	35
Discharge of Mortgage, original, where mortgage was assigned by way of mortgage to secure payment of a sum less than the original mortgage money, is a good discharge if executed by the mortgagees under the original and derivative mortgages .....	36
Discharges of Mortgages, old, executed by attorney, may be registered without requiring registration of the Powers of Attorney .....	38
Discharge of Mortgage, Certificate of, signed by the executors of the survivor of two joint mortgagees, may be registered .....	41
Discharge of Mortgage, Certificate of, signed by three out of four executors of mortgagee, may be registered .....	45
Discharge of Mortgage, covering land in Ontario, administrator of the estate of a mortgagee appointed by a Surrogate Court in another province is not competent to sign a valid, unless Ancillary Letters of Administration have been obtained in this province .....	46
Dominion Expropriation Act, Notice of Expropriation of Lands for canal under, may be placed on Record and noted in Abstract Index .....	47

## E.

Effects of Registration, of Certificate of Discharge of Derivative Mortgage.....	10
Execution, imperfect, verification of a Conveyance by a Company as Grantors....	39
Executors, Certificate of Discharge of Mortgage signed by three out of four executors may be registered .....	45
Execution of Notice of Expropriation of lands for canal under Dominion Expropriation Act, affidavit of, not necessary .....	47
Expropriation, Notice of, of lands for canal under Dominion Expropriation Act may be placed on Record and noted in Abstract Index .....	47

## F.

Fees for searches .....	16
-------------------------	----

## G.

General Register, Will may be registered in short form in, where the executor makes affidavit that the Will does not affect lands in Registry Division except in regard to mortgages .....	23
General Register, Will affecting lands without local description may be registered in the separate register without being registered in .....	21
General Register, a Grant of all the Real Estate of "A" without local description may not be registered in the General Register merely because there is also in the Instrument a Power of Attorney in favor of the Grantee to make sales....	33
Grant, of all the Real Estate of "A" without local description may not be registered in the General Register merely because there is also in the Instrument a Power of Attorney in favor of the Grantee to make sales .....	33

## H.

Highways laid out on plan of subdivision of lots, width of .....	27
--	----

## I.

Imperfect Execution, verification of conveyance of Conveyance by a Company as Grantors .....	39
--	----



	PAGE
Incomplete Instrument, cannot be registered .....	28
Instrument, certified copy of, Registrar is entitled to charge for, whether he makes such copy himself or whether such copy is made by another provided he has been requested to furnish such certified copy .....	8
Instrument, incomplete, cannot be registered .....	28

## J.

Joint Mortgagees, Certificate of Discharge of Mortgage signed by executors of, may be registered .....	41
--	----

## L.

Lake Shore, observations as to measurements of lots extending to .....	30
Letters of Administration, Ancillary, must be obtained by Administrator of the estate of a mortgagee appointed by a Surrogate Court in another province to be competent to sign a valid discharge of mortgage covering land in Ontario .....	46
Liquidator of a Company who were mortgagees, Discharge of Mortgage by .....	19
Lunatic, Committee of, Discharge of Mortgage executed by, may be registered without requiring registration of the Order of the Court appointing the Committee, especially where the Discharge is approved by the Official Referee .....	20

## M.

Machinery, observations regarding copies of Orders for .....	8
Measurements, of Lots extending to a Lake Shore, observations as to .....	30
Money By-laws, what signatures of officials are necessary to authenticate copies of, for registration .....	15
Money By-law, observations regarding registration of after lapse of four weeks .....	40
Mortgage, Derivative, Certificate of Discharge may be given of a .....	10
Mortgage, Discharge of, executed by an assignee of the Mortgage and mortgage money and interest may be registered although the assignment of mortgage omits part of the lands covered by the mortgage .....	12
Mortgage, Discharge of, by a liquidator of a company who were mortgagees .....	19
Mortgage, Discharge of, executed by Committee of a lunatic, may be registered without requiring registration of the Order of the Court appointing the Committee, especially where the Discharge is approved by the Official Referee .....	20
Mortgage, made to a Partnership, may be discharged by one of the partners without requiring the registration of the partnership .....	25
Mortgage, Assignment of, Mortgagor is competent witness to .....	28
Mortgage, Discharge of, by two out of three trustees who were not mortgagees, the document under which the new trustees claim interest in the mortgage should be registered, etc. ....	32
Mortgage, Discharge of, by a number of trustees of a church and does not name all the trustees who were mortgagors, if it clearly identifies the mortgage is sufficient for registration .....	34
Mortgage, made to a husband and wife as mortgagees, may be discharged by the survivor where the mortgage was made to them jointly and not in shares .....	35
Mortgage, where assigned by way of mortgage to secure payment of a sum less than the original mortgage money, a discharge of the original mortgage executed by the mortgagees under the original and Derivative mortgages is a good discharge of both mortgages .....	36
Mortgage, old discharges of, executed by Attorney, may be registered without requiring registration of the Powers of Attorney .....	38
Mortgagor, is competent witness to Assignment of Mortgage .....	28
Municipality, assent of, not necessary for registration of plan of a number of lots laid out for a summer resort and showing one private way or boulevard or place for recreation .....	13

## N.

Notice of Expropriation of Lands, for Canal, under Dominion Expropriation Act, may be placed on Record and noted in Abstract Index .....	47
Notice of Expropriation of Lands, for canal, under Dominion Expropriation Act, affidavit of execution not required .....	47

## O.

Objections, taken by Solicitors to abstract furnished by Registrar .....	42
Observations, regarding copies of Orders for machinery .....	8



	PAGE
Observations, as to requirements in cases where mortgage is discharged by Liquidator of a Company who were mortgagees .....	19
Observations, <i>re</i> Discharge of Mortgage .....	23
Observations, as to measurements of Lots extending to a Lake Shore .....	30
Observations, <i>re</i> registering grants of Real Estate without local description.....	33
Observations, as to signature of a person purporting to countersign Conveyance by a Company as Grantors .....	39
Observations, regarding registration of a Money By-law after the lapse of four weeks .....	40
Observations, as to form and contents of abstract furnished by Registrar.....	42
Officials, what signatures of are necessary to authenticate copies of Money By-laws for registration .....	15
Orders for Machinery, observations regarding copies of .....	8

## P.

Particulars, of registration of a Power of Attorney under which a Discharge of Mortgage is executed may be stated either in or endorsed upon the discharge.....	29
Partnership Mortgage made to a, may be discharged by one of the partners without requiring registration of the partnership .....	25
Plan of Subdivision, in connection with registration of, not necessary to inquire into title previous to the Registration of a Certificate of Title under the Quiet-ing Titles Act .....	30
Plan of Subdivision of Lots, width of Highways laid out on .....	27
Plan, of a number of Lots laid out for a summer resort and showing one private way or boulevard or place for recreation, registration of, Assent of Municipality not necessary .....	13
Plan subdividing lands, for purpose of registration of Registrar may disregard mortgages, the description of lands in which may possibly cover the lands to be subdivided, etc. ....	17
Power of Attorney, particulars of registration of, under which a Discharge of Mortgage is executed may be stated either in or endorsed upon the Discharge.....	29
Power of Attorney, see Grant .....	33
Powers of Attorney, old Discharges of Mortgages executed by Attorney may be registered without requiring registration of .....	38
Private Way, see Plan .....	13

## R.

Railway Rights of Way, description in Deeds of .....	18
Registrar, is entitled to charge for properly certified copy of an instrument, whether he makes such copy himself or whether such copy is made by another provided he has been requested to furnish such certified copy .....	8
Registrar, may disregard Mortgages, the description of lands in which may possibly cover lands to be subdivided, etc., for purposes of registration .....	17
Registration, of a Certificate of Discharge of a Derivative Mortgage, effects of....	10
Registration, of Plan of subdivision, where made for the person appearing by the Registry Books to be the owner of the land, Registrar may disregard Tax Deed containing indefinite or imperfect description erroneously or improperly registered against a lot .....	11
Registration, of Plan of a number of lots laid out for a Summer Resort and showing one private way or boulevard or place for recreation, assent of Municipality not necessary for .....	13
Registration, of Money By-laws, what signatures of officials are necessary to authenticate .....	15
Registration, of Plan subdividing lands, Registrar may disregard mortgages the description of lands in which may possibly cover the lands to be subdivided, etc., for purposes of registration .....	17
Registration, of Will, affecting lands without local description, may be registered in the separate Register without being first registered in the General Register provided it has attached to it a Statutory Declaration describing the lands to be affected .....	21
Registration, of Power of Attorney under which a Discharge of Mortgage is executed may be stated either in or endorsed upon the Discharge .....	29

	PAGE
Registration, of a Plan of subdivision, in connection with, not necessary to inquire into the title previous to the registration of a Certificate of Title under the Quieting Titles Act .....	30
Registration, of a Money By-law after the lapse of four weeks, observations <i>re</i> ....	40
Rights of Way, Railway Description in Deeds of .....	18
S.	
Searches, fees for .....	16
Searches, subsequent, made some days after original search into the title of the same lot, both searches should be paid for .....	16
Signatures of Officials, what, are necessary to authenticate copies of Money By-laws for registration .....	15
Statutory Declaration, of Explanations, cannot be registered .....	28
Subsequent Search, made some days after the original search into the title of the same lot, both searches should be paid for .....	16
T.	
Tax Deed, containing an indefinite or imperfect description erroneously or improperly registered against a lot, may be disregarded by the Registrar in connection with the registration of a Plan of subdivision of the land made for the person appearing by the Registry Books to be the owner of the land.....	11
Trustees, where two out of three who execute a Discharge of Mortgage were not mortgagees the document under which the new trustees claim interest in the Mortgage should be registered .....	32
V.	
Verification, of Conveyance by a Company as Grantors .....	39
W.	
Width of Highway laid out on Plan of Subdivision of Lots .....	27
Will, which affects lands without local description may be registered in the separate register without being first registered in the General Register provided it has attached to it a Statutory Declaration describing the land affected .....	21
Will, may be registered in short form in the General Register where the executor makes affidavit that the will does not affect land in Registry Division except in regard to Mortgages .....	23
Will, Probate of, not complete for Registration under Section 56 of the Registry Act unless a certified copy of the Will forms part of the Probate .....	31







SEVENTEENTH ANNUAL REPORT

OF THE

# Provincial Municipal Auditor

FOR

1913

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PRINTED BY ORDER OF  
THE LEGISLATIVE ASSEMBLY OF ONTARIO

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TORONTO :

Printed and Published by L. K. CAMERON, Printer to the King's Most Excellent Majesty  
1914.

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WILLIAM BRIGGS,  
29-37 Richmond Street West,  
TORONTO.

To His Honour SIR JOHN MORISON GIBSON, K.C.M.G.

*Lieutenant-Governor of Ontario.*

MAY IT PLEASE YOUR HONOUR:

I have the honour to present to you the report of the Provincial Municipal Auditor for 1913.

J. J. FOY,

*Attorney-General.*

PARLIAMENT BUILDINGS,

Toronto, January, 1914.

TORONTO, January, 1914.

TO THE HONOURABLE J. J. FOY, K.C., M.P.P.

*Attorney-General of Ontario.*

SIR,—I have the honour to present to you my report for the year 1913.

I have the honour to be,

Sir,

Your obedient servant,

J. W. SHARPE,

*Provincial Municipal Auditor.*



# Report of the Provincial Municipal Auditor

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Toronto, January, 1914.

To THE HONOURABLE J. J. FOY, K.C., M.P.P.

*Attorney-General of Ontario.*

SIR,—I have the honour to submit to you the Seventeenth Annual Report of the Provincial Municipal Auditor.

## UNIFORM ACCOUNTING.

For some years past the question of uniform municipal accounting has been much studied and discussed by municipal associations and others interested in the government of municipalities, but the conditions in this Province are not always clearly understood; much of the discussion has been based upon the assumption that no uniform system exists in Ontario, now this is quite incorrect. In 1897 the Act to make better provision for the keeping and auditing municipal and school accounts was passed. Under its provisions a form of municipal cash book was prepared and approved by the Lieutenant Governor in Council for the use of all municipalities, except cities with over 15,000 population. This cash book is so arranged that all items of receipts and expenditures, in all municipalities in which the Act requires it to be used, shall be properly grouped under distinctive headings. The book has for some time been in general use, the items in many municipalities are well classified, in others not so well, partly owing to the inefficiency of the book-keeper and partly to the local needs of the municipality. As municipal statistics are collected by the Bureau of Industries, the headings in the authorized cash book have recently been slightly altered to harmonize with the classification adopted by the Bureau. The use of the cash book has undoubtedly resulted in improved and more uniform municipal accounting.

The Act above referred to directs that it shall be the duty of the Provincial Municipal Auditor to frame rules respecting the number and forms of books of account to be kept and the system of book-keeping to be adopted by the treasurers of municipalities coming under the provisions of the Act. It has been objected that the "Systems of Account in operation" are elementary and the records defective. Critics do not appear to realize, that the system is designed to meet the local requirements of the municipalities, and also form a basis of information and statistics for the use of the Bureau of Industries. It should not be forgotten that the system applies to more than eight hundred municipalities in the Province of Ontario, in every degree of development, from the newly formed township, where the simplest methods are sufficient, to the larger town with its public works, local improvement, etc., where an advanced and scientific system of accounting is necessary. Where so much ground is to be covered it may be that, in some cases the system is a "misfit."

though no such cases have yet been brought before me. Under all existing conditions I submit that the cash book now in use is not open to very much criticism.

### MUNICIPAL REFORM.

The subject of municipal reform has been brought before me on many occasions during the past year. Theories of government have been studied more or less earnestly and discussed with much intelligent interest. Many critics of our system have looked with admiring eyes upon the varied forms which prevail in other countries, more particularly in the United States and in Germany. It is not necessary to question results in these countries, it is sufficient to say that conditions which exist there do not prevail in Ontario. Advocates of changes, assume that our system is very imperfect and is responsible for much of the culpable occurrences which have occurred in some municipalities. Investigation will, I think, show without doubt that these occurrences are the result of blameable administration rather than faulty organization or system. I do not mean to say that municipal officials in Ontario as a class are incompetent or untrustworthy, my experience has been quite the contrary. I have met with many councillors and salaried officials who are diligent, capable and patriotic, who are doing a good work, and whose administration of their local municipal affairs has been successful.

The science of municipal government is a progressive one, as social and economic conditions change, so no doubt we will be confronted with new and perhaps more complex problems and more advanced methods may be found advisable; at the same time, in order to ensure good results, a large measure of permanence is required, frequent changes create confusion, those whose duty it is to administer should have opportunity to become familiar with the provisions of the law and the best methods of administration. This is an age of development, and our present Municipal Act is not behind the age.

### PUBLIC UTILITIES.

In the matter of book-keeping I find it difficult in some cases to impress upon municipal officials the necessity for better methods of keeping accounts in connection with public utilities so that each branch of public service may bear its own burdens. For instance in town A public library is supplied with light, heating and water from the corporation systems free of charge. The salaries of librarian and caretaker, who perform other municipal duties, are not fairly apportioned. In town B all these services are properly distributed. It is apparent that fair comparison of cost in these towns is not possible. In town A the lighting and water works systems do not get proper credit for services rendered, and the benefit derived from them is not fully shown. A little consideration will convince municipal officials that statistics formulated from such a basis are absolutely worthless.

### AUDITORS' PAMPHLET.

The pamphlet which was prepared some years ago for the instruction of auditors has been revised in view of changes in the Acts affecting municipal accounts. The pamphlet will be reprinted and will be mailed to municipal officials in due course.

## SPECIAL AUDITS.

## TOWNSHIP OF EASTNOR.

On November 19th, 1912, an application was received from the Township Council asking for an audit of the accounts in connection with "Judge's Creek Drain." On January 8, 1913, Mr. Oscar Hudson, chartered accountant, was appointed to make the necessary investigation. His report and a supplementary report by myself are submitted herewith. Cost \$262.

## TOWNSHIP OF HOWARD.

On November 19th, 1912, a petition was received from 35 ratepayers resident in this Township, asking for an audit of the financial affairs of the Township. On 26th February, 1913, I attended at the town of Ridgetown, interviewed some of the parties interested and examined the books of the Treasurer. Subsequently nine of the petitioners requested in writing that their names be withdrawn from the petition. The prayer of the petition was not granted.

## TOWNSHIP OF GLOUCESTER.

On March 25th, 1913, a petition was received from 50 resident ratepayers of this Township asking for an audit of the financial affairs of the municipality. On May 5th, 1913, Mr. George L. Batch, of Ottawa, chartered accountant, was appointed to make the necessary investigation. His report is submitted herewith. Cost \$225.

## SOUTH PLANTAGENET.

On 9th April, 1913, a petition was received from 30 ratepayers of this township asking for an audit of the municipal accounts. Mr. George L. Blatch, of Ottawa, chartered accountant, was appointed to make the necessary audit, but the investigation has unavoidably been delayed.

## TOWNSHIP OF TAY.

On 3rd October, 1913, a petition signed by 77 resident ratepayers of this township was received, asking for an investigation of the financial affairs of the municipality. On the 9th October, 1913, Mr. A. F. Falls, of Toronto, chartered accountant, was appointed to make the necessary audit, which has not yet been completed.

## TOWNSHIP OF TISDALE.

On 12th September, 1913, a petition signed by 89 resident ratepayers of this municipality, asking for an audit of the financial affairs of the Township was received. On 1st October, 1913, Mr. C. E. Hammond, of North Bay, chartered accountant, was appointed to make the necessary investigation. Mr. Hammond's report is being reviewed.

## TOWNSHIP OF TINY.

On 29th May, 1913, a petition signed by 57 resident ratepayers of this township was received asking for an audit of the financial affairs of this municipality.

On 25th September, 1913, Mr. C. G. Powell was appointed to make the necessary investigation. His report thereon is submitted herewith. Cost \$290.70

TOWN OF NEWMARKET.

On December 4th, 1913, a petition signed by 43 resident ratepayers of this Town was received asking for an audit of the financial affairs of the municipality. On 10th December, Mr. A. P. Scott, of Toronto, chartered accountant, was appointed to make the necessary investigation, which has not yet been completed.

I have the Honour to be,

Sir,

Your obedient servant.

J. W. SHARPE,  
Provincial Municipal Auditor.

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## APPENDIX

The following are not in all cases complete copies of reports.

### JUDGE'S CREEK, EASTNOR.

*To the Reeve and Council, Township of Eastnor, County of Bruce, Ontario,*

GENTLEMEN,—Acting upon an Order-in-Council approved by his Honor the Lieutenant-Governor of Ontario the 7th day of January, 1913, an investigation was made into the accounts of the Judge's Creek Drainage Scheme.

Resolution of Council under date of November 9th, 1912, asked for the audit of the drainage scheme.

Council was apparently unable to find out the status of the drainage accounts as no ledger had been kept. Ratepayers complained that;

1. Debentures authorized to be issued under By-law No. 551 were for \$11,600.00, whereas only \$10,000.00 of Debentures were sold. However, levy was made from the year 1902 to 1911 for the redemption of an issue of \$11,600.00.

2. Such overlevies had been used by the Council for General Purposes instead of for the Drainage Scheme.

3. Drains south of the 10th side-road and east of the second concession west were not constructed according to Engineers' report.

### *Scope of Investigation.*

Construction was first commenced in the year 1900 and By-law No. 551 was finally passed on the 16th March, 1901. It was necessary therefore, to go over all the records from 1900 to 1913, a period of thirteen years.

No Ledger had been kept and what rough notes were obtainable from memorandum books were of little use.

Auditors' Report for the various years contained the expenditures in a subsection, but inclusion was made of items that had no reference to the Judge's Creek, while many items such as legal costs were charged elsewhere.

### *Construction.*

Statement showing receipts, from the proceeds of Debenture sales; Government Grant; Special Levy and Interest earned, and Expenditures on construction is attached hereto.

There appears to be a balance of \$457.93 not expended, so that this sum may be used for further construction.

Land in that part of the Township commonly termed "The Swamp" is unclaimed to a great extent, and is assessed at a low rate per acre.

It is claimed that owing to the insufficient drainage in certain sections, supposed to be served by the Judge's Creek, the quagmire cannot be drained, as with

proper drainage facilities the water will drain away, and with the heat of summer drying the surface refuse matter, it is possible then to burn it off, and leave excellent soil uncovered for farming purposes.

Naturally with the improvement of such lands, the assessments will be increased considerably and the Municipality will have a larger assortment upon which to pro-rate the general taxes.

### *Cost of Construction.*

Engineer's estimate of cost attached to By-law No. 551 totals to \$11,600.00 and a contrast is made hereunder with the actual cost of construction.

ENGINEER'S ESTIMATE.		ACTUAL COST.	
Construction .....	\$9,150 00	Construction .....	\$12,400 00
Purchase Dam Rights .....	2,000 00	Chalmers .....	\$10,700 00
Engineering .....	300 00	Graham Ditch .....	1,700 00
Other Expenses .....	150 00		
	\$11,600 00		\$12,400 00
Increase over Estimate .....	4,400 00	Purchase Dam Rights .....	2,000 00
		Engineering .....	400 00
		Other Expenses .....	1,200 00
		Legal .....	\$400 00
		Sundries .....	800 00
			\$1,200 00
			\$16,000 00
	\$16,000 00		\$16,000 00

### *Overlevies By-law No. 551.*

By-law No. 551 provided for the debenture issue and sale of \$11,600.00.

Engineer's estimate of cost of construction was \$10,000.00, but this was amended as the Barrow Bay Dam Rights that he estimated could be purchased for \$400.00, was finally bought for \$2,000.00 from Seaman, Hunter & Crawford Company under By-law No. 545.

Total acreage of lands benefited was reported by the Engineer as 10,000 acres; 8,000 acres of this belonging to ratepayers and 2,000 acres or 20% being the proportion to be assumed by the Township.

Annual rate per 100 acres to be levied on 10,000 acres was correctly \$8.54, provided that all of the \$11,600.00 debenture were sold and the acreage was not altered.

Debentures amounting to \$10,000.00 only were sold, and coupled with this was the acreage which was increased by the Court of Revision to 10,238 acres.

This overlevy continued from 1902 to 1911, making a total overlevy or surplus of \$1,367.30.

By-law No. 946 passed in 1912 amended the rate per 100 acres from \$8.54 to \$7.19, which provides annually \$735.82, the amount of the annual debenture.

Expenditure of this surplus is left to the Council's discretion after their perusal of the advice of J. W. Sharpe, K.C., appearing later in this report.

Wrong calculations appearing in the Collectors' Rolls for the several years are

shown hereunder. Certain overcharges already rebated by Council as per schedule have not been considered.

Con. 1 W., Lot 4.	Overcharge,	1902 Roll.....	\$0 43	
" 1 E., " 5.	"	1909 " .....	5 11	
" 1 E., " 7.	"	1902-1909 Roll.....	2 20	
" 1 E., " 18.	Shortcharge	1906 Roll.....		\$3 85
" 1 E., " 19.	"	1905 " .....		5 00
" 1 E., " 20.	"	1904 " .....	\$0 84	
		1907 " .....	2 08	
				2 92
" 2 E., " 15.	"	1908 " .....		4 27
" 2 E., " 20.	"	1906 " .....		0 47
" 3 E., " 2.	Overcharge,	1902 " .....	0 85	
" 3 E., " 3.	Omitted,	1908 " .....		8 54
" 3 E., " 14.	"	1905 " .....		8 54
" 3 E., " 15.	Shortcharge,	1907 " .....		1 26
" 4 E., " 3.	"	1903 " .....	1 00	
	"	1904 " .....	1 00	
				2 00
" 4 E., " 4.	"	1902 " .....	\$0 80	
	Overcharge,	1909 " .....	0 85	
" 4 E., " 7.	Shortcharge,	1902-1909 Roll.....		4 66
" 4 E., " 14.	Overcharge,	1902 Roll.....	1 26	
" 4 E., " 15.	"	1902 " .....	1 26	
" 4 E., " 16.	Shortcharge,	1902 " .....		0 43
" 4 E., " 17.	"	1902 " .....		0 44
" 5 E., " 1.	Omitted,	1906 " .....		1 72
" 5 E., " 2.	"	1906 " .....		2 19
" 6 E., " 15.	Overcharge,	1908 " .....	5 09	
" 6 E., " 19.	"	1904-1911 Roll.....	6 72	
" 1 W., " 1.	"	1907 } Roll.....	3 43	
	(Not in scheme)			
Net Shortcharges .....			\$26 40	\$46 29
			19 89	
			\$46 29	\$46 29

#### *Shortlevies By-law No. 756.*

In completing that part of the drainage scheme known as the Graham Ditch and redeeming outstanding liabilities left over from the construction, under By-law No. 551, it was found necessary to get the Provincial Legislature to pass a special Act sanctioning the issue of more debentures amounting to \$2,800.00.

Schedule of yearly rates to be levied attached to the By-law shows that the ratepayers are chargeable with \$203.11, and the township with \$50.78, making a total of \$253.89.

This is incorrect, as the rate properly calculated should produce from the ratepayers \$208.57, and from the township \$52.15, making a total of \$260.72, which amount is sufficient to meet the annual maturing debenture and interest coupons.

Miscalculations are traceable to the rate in use, which is \$2.48 per hundred acres. The correct rate is \$2.54½ per hundred acres, and the difference of 6½c. accounts for the short levies from 1906 to 1912, amounting to \$50.59.

Carelessness in the preparation of the Collectors' rolls accounts for the following differences in the levies made under the above By-law.

Schedule of amounts to be collected, which is attached to the By-law, could have at least been followed, and such amounts inserted in the roll.

Excuse that the remuneration for the duties involved was not adequate is

not permissible, as the decision is left to the official whether to hold office or not, but while he does, he must assume all the duties dedicated to his position.

Con. 1 W., Lot 13.	Overcharge,	1907.....	\$0 38	
		1908.....	0 35	
		1909.....	0 99	
				\$1 72
" 1 W., " 17.	Omitted,	1906.....		\$1 24
" 1 E., " 5.	Overcharge,	1909.....	1 49	
" 1 E., " 20.	Shortcharge,	1908.....		0 62
" 2 E., " 15.	"	1908.....		1 23
" 3 E., " 3.	Omitted,	1908.....		2 47
" 3 E., " 15.	Shortcharge,	1907.....		0 37
" 4 E., " 1.	"	1907.....		1 60
" 4 E., " 4.	Overcharge,	1909.....	0 25	
" 1 W., " 1	"	1907 }		1 00
	(Not in scheme)			
			\$3 46	\$8 53
			5 07	
			\$8 53	\$8 53
Net Shortcharges .....				

### *Levies for Maintenance and Construction.*

By-law No. 664 authorized a levy of \$170.00 in the year 1904 to cover the cost of maintenance to that date.

Inaccuracies in the levying of this rate in the Collector's roll are:—

Con. 1 W., Lot 19.	Shortlevied	\$1 00
" 4 E., " 16.	"	0 64
" 4 E., " 18.	"	0 72
" 5 E., " 16.	Omitted	2 85
" 5 E., " 17.	"	4 75
" 6 E., " 18.	"	4 28
		\$14 24

By-law No. 822 authorized a levy of \$600.00 in 1907 for the completion of construction work on the Graham ditch.

However, the Collector's roll shows a levy amounting with the Township's portion to \$1,507.29.

There is no By-law or even resolution in the minutes to designate what this additional \$900.00 was for. However, the Reeve and Clerk stated that this amount was to cover maintenance charges.

Council's attention is directed to the Municipal Drainage Act, Section 76, which states "That Council may maintain and further construct without report from engineer, provided the cost of such work is not above one-fifth of the cost of original construction and does not exceed in any case \$800.00."

No engineer's report was seen, and it appears that the proceedings were not in accordance with the Act.

Inaccuracies appearing in the Roll are:—

Con. 3 E., Lot 15.	Shortlevied	\$2 20
" 4 E., " 6.	Overlevied	\$2 00
" 1 W., " 1.	Not in scheme	5 85
		\$2 20
		\$7 85

In the case of Con. 1, W. Lot 1, this lot was never included in the drainage



scheme, and 1907 appears to be the only year in which levy and collections were made. Total levy made on this lot was:—

Under By-law 551 .....	\$3 43
756 .....	1 00
822 .....	5 85
	<hr/>
	\$10 28

and the amount is returnable to the payer, S. L. Rutherford.

In 1909 By-law 875 authorized a levy of \$250.00 to be collected for maintenance purposes. Actual levies, however, were \$297.30. Over and short levies in connection with this By-law were:—

Con. 1 W., Lot 13. Overlevied .....	\$0 73
“ 1 E., “ 5. “ .....	0 73
“ 2 E., “ 2. “ .....	0 71
“ 5 E., “ 19. Omitted .....	\$1 71
	<hr/>
	\$1 71      \$2 17

In 1911 an amount of \$235.83 was levied and collected, apparently for maintenance, although no By-law was seen, nor any mention made in the minutes thereto.

Statement showing the levies made and the yearly payments for maintenance exhibit a surplus or overlevy of \$91.47, notwithstanding that no maintenance levy was made in 1912, although \$377.95 was expended.

Therefore, maintenance for 1913 may only be levied for after a deduction of \$91.47 has been made from that year's cost.

#### DAMAGES AND COSTS.

Questions involving certain charges made to the drainage scheme were submitted to Mr. J. W. Sharpe, K.C., the Provincial Municipal Auditor. The questions and the answers thereto are alternately arranged hereunder.

Section 91 of the Municipal Drainage Act provides that “Reference and certain incidental expenses be included in the cost of construction or maintenance of drains.”

Certain items were charged to the above named drain and appear in the Auditors' Reports for the various years against the scheme.

Much litigation has been occasioned over the various drains constructed in the past ten years. In the case of the Swan Lake Drain, the municipality was put to the expense of close on \$2,000 in damages and law costs, by one of the ratepayers taking action on account of that drain not being completed according to plans.

On this account would you kindly give your opinion as to the legality of including the amounts shown hereunder in the Judge's Creek Drain.

Q 1.—David Chalmers, contractor on the scheme, brought suit against the Municipality in 1904, to recover a certain sum retained by the Council on account of his work in places not agreeing with the specifications. The case was settled before judgment was given, both parties agreeing to pay their own costs. The cost to the Municipality amounted to \$267.55 and was charged to the scheme.

A. 1.—The costs appear to have been incurred in proper defence of an action

brought by David Chalmers. I think, therefore, that such costs are properly charged against the Drainage Scheme.

Q. 2.—William Shaw, Lot 19, Con. 1 East, claimed damages on account of a ditch connected with the scheme being dug diagonally, instead of running the same through the centre of the lot, according to the Engineer's report. He was paid \$65.00 and a By-law No. 658 was passed to this effect. Changing the course of the drain saved cost on the construction and allowed for a better fall for the water.

A. 2.—The Council had no power to make any variation in the course of the drain as laid out by Engineer's report and any expense caused by such variation cannot be charged against the Drainage Scheme.

Q. 3.—William Graham, owner of lots 8 and 9 in Con. 3 East, was paid damages amounting to \$115.00 on advice from solicitor. The section of the drain that was to pass through his lots, although clearly shown in the engineer's report, was not constructed at the time of claim in 1906. There is no record made, either in the minutes or by-laws why this section was cancelled, and in 1906 the by-law No. 756 authorizing the issue of debentures was made up of an amount to construct this section and take up former indebtedness of the scheme.

A. 3.—I understand that damages were incurred by reason of the neglect of the Council to construct the "Graham Branch" of the drain. In such case the amount paid as damages should be charged against the Municipality at large.

Q. 4.—Costs of the issue of debentures under By-law No. 756 to complete construction, and three other debenture issues under different By-laws, and procuring a special Act for the sale thereof, as the debentures were not sold within two years of the passing of the former by-laws, amounted to some \$400.00. Solicitor advised prorating the costs of the four by-laws, so that each by-law would be taxed with approximately \$100.00.

A. 4.—By-law No. 756 provides that the costs shall be paid out of proceeds of debentures; they are, therefore, properly chargeable against the drain.

Q. 5.—Statements show that there is an amount of \$1,866.11 unexpended on the Judge's Creek after being specially levied and collected, for specific purposes. The major part of this is \$1,367.30 being made up of overlevies for the years 1902 and 1911 under By-law No. 551 for the redemption of debentures.

Council are now anxious to complete a section of the drain south of the 10th sideroad and east of Con. 3 over which there is several complaints registered and they wish to use the surplus arising out of the overlevy for debenture redemption for this purpose.

Section 69, paragraph 3, Municipal Drainage Act seems to deal with this matter and allow such action.

The Engineer's report in 1901 stated the proportion to be borne by the municipality as twenty per cent. and the acreage of the ratepayers benefited after being altered by the Court of Revision in that same year has been the basis for all levies, either for debenture redemption or maintenance cost, since that date.

A. 5.—I have investigated the facts in connection with the different By-laws; the Confirming Act and the surplus of \$1,866.11 and I find them very much involved.

Although \$10,000.00 only of \$11,600.00 of debentures authorized by By-law 551 was issued, the Council levied a rate in each year sufficient to pay instalments of the whole amount of \$11,600.00 and continued this practice until the year 1912. The result is that the Council has now on hand \$1,367.30, moneys which

should not have been collected. Of this amount, upwards of \$500.00 appears to have been collected prior to April 27, 1906. On that date by Sec. 2, Chap. 69, Ontario Statutes, all assessments and levies which had been made under By-law 551 were "ratified and confirmed." The Act referred to, confirmed By-law 756, which provided that the assessments and levies therein directed should be taken in substitution of the provision of By-law 551 in respect of the excess required over and above the amount of debentures, then already issued thereunder and By-law 551 was amended accordingly. The position, therefore, appears to be that the moneys collected prior to April 27th, 1906, are by virtue of the Act of the Legislature legally in the hands of the Council; all moneys (part of the excess) collected since that date have been so collected without any semblance of authority whatever. The purpose for which the \$1,367.30 was collected was the payment of \$1,600.00 of debentures which have never been issued and the question arises, "what disposal can now be made of the money on hand?" The amount mentioned was not collected for construction purposes, consequently cannot be used to complete the construction of the drain; neither does the case come under the provision of S.S. (3) Section 69 of the Municipal Drainage Act, which refers to "any By-law" "which provides more than sufficient funds" "for the redemption of the debentures authorized to be issued thereunder," it would, therefore, appear that the amount cannot be disposed of as provided by that subsection. To refund the moneys to the persons from whom it was illegally collected is scarcely practicable, and not free from objection, especially as to the moneys collected prior to the Act of 1906, which "ratified" or sanctioned the levies.

In a matter so complicated and without precedent, I hesitate to offer any suggestions. It will be for the Council to consider whether they will use the \$1,367.30 in the redemption of debentures now outstanding against the drain, with the possibility that no objection will be raised or adopt the safer but more expensive course of a By-law providing a mode of distribution, confirmed by the Legislature.

The balance of \$457.93 standing in construction account may be used for construction purposes. The \$91.47 balance in maintenance account may not be so used.

#### DEBENTURES.

Debenture Issue under By-law No. 551 was sold to G. A. Stimson and Company, on January 25th, 1902, for \$10,330.47 made up of

Debentures at par .....	\$10,000 00
Premium . . . . .	5 00
Accrued Interest from April 1st, 1902 .....	325 47
	<hr/>
	\$10,330 47

Debenture Issue under By-law No. 756 was sold to J. C. Eckford on November 22, 1906, for \$2,906.88 made up of

Debentures at par .....	\$2,800 00
Premium .....	4 00
Accrued Interest .....	102 88
	<hr/>
	\$2,906 88



Cash book entry did not state who paid the money in either sale. In the sale of By-law 756 debentures, the entry contained the gross total of several debenture sales and it was necessary to analyze this amount into principal, premium and accrued interest for the different issues.

Debenture tables are included among the statements and the date of redemption and cash book folio has been marked thereon.

#### MAPS AND PLANS.

Plan of the Drainage Area and Map showing the profiles and cross sections of the construction of the Judge's Creek are in the Township's possession. These were referred to constantly and were of great help in determining the location of the various branch drains.

Plan accompanying this report has been specially prepared to exhibit in detail the acreage assessment on lots. It is not drawn strictly to true scale, as road allowance is somewhat large, so as to clearly show drains on the concession or side-roads. Key to the drawing will show that with the aid of different colored inks it has been possible to designate the original plan under By-law 551 and the various changes made thereafter.

Assessments as contained in the Engineer's report were inserted on the plan in black ink and the alterations made subsequently by the Court of Revision appear in red ink.

Different sections of the drain are lettered concurrently with the Engineer's report, embodied in By-law No. 551.

Observance of that section south of the 10th side-road will show those rate-payers complaining of the insufficient drainage, although the construction under paragraph 2 of the Engineer's report should have relieved this trouble, but it is stated that such construction was not fully carried out.

#### COLLECTOR'S ROLLS 1902 TO 1912.

Levies for the several years for the Judge's Creek Drainage had to be drawn off in detail onto lists.

This work occupied considerable time and was occasioned by the neglectful way in which the Rolls from 1902 to 1909 were finished.

Rolls for the years 1902 to 1905 contained all levies for various drainage schemes in one column, only the total tax column was added, but no summary of the separate pages was made.

Rolls for the years 1906 to 1909 had separate columns for the different drainage schemes, but no additions of any but the total column were in evidence and no summary was seen.

Rolls for the years 1910 to 1912 contained levies for the several purposes in separate columns but no summary appeared in the Roll.

Audit of the Rolls has been made each year by the Reeve and Clerk for the years 1905 to 1911.

Clerks' certificate before handing the Roll to the Collector and the Collector's affidavit, on the return of the Roll, as prescribed by the Assessment Act has not been complied with, as the table adjoined will show.



Collectors must insert the "date of Demand of Taxes." This has only been done for the years 1902 and 1903.

	Audited.	Clerk's Certificate.	Date of Demand.	Collector's Affidavit.
1902 .....	No	Yes	Yes	No
1903 .....	No	Yes	Yes	No
1904 .....	No	Yes	No	No
1905 .....	Yes	Yes	No	Yes
1906 .....	Yes	No	No	No
1907 .....	Yes	No	No	No
1908 .....	Yes	No	No	No
1909 .....	Yes	No	No	No
1910 .....	Yes	Yes	No	No
1911 .....	Yes	Yes	No	No
†1912 .....		Yes		

†Roll not returned; time extended to 2nd February, 1913.

#### INSURANCE.

Policy No. 4888069, in the Northern Assurance Company, Limited, for \$1,500.00 on the Village Hall and contents, was found in order.

Premium is \$22.50 and the expiry date 17th September, 1913.

#### BONDS.

Treasurer's Bond No. 03023 in the Imperial Guarantee and Accident Company, of Canada, for \$1,000.00. Premium is \$5.00 which is paid by the Treasurer, S. C. Cooper, and the date of expiry is 15th February, 1913.

Collector's Bond for \$2,000.00 is signed by three bondsmen. These are William J. Bray, Jnr., James Prescott and the Collector, Frank Hill.

Bonds were scrutinized and are in the care of the Clerk.

#### MINUTES.

Four minute books were seen and labelled with the date of their contents. They were not indexed and the following dated minutes were not signed by the Reeve:

November 12, 1904.  
February 15, 1908.

December, 15, 1904.  
December 30, 1901.

Minutes in places are very vague and leave much to the reader's imagination. Reference must be made to letters received, the contents thereof, and their final disposal.

Those minutes from February of 1901 to date, pertaining to the Judge's Creek Drain, were extracted, as constant reference was made thereto. Many important matters that should have been embodied in them were, however, omitted, and enquiry of the officials for the various years supplied some of the missing information.

List of these minutes with date and subject matter accompany this report.

A chronological table of Township Officials for the years 1900 to 1913 is attached also.

#### BY-LAWS.

By-laws seen were contained in six books. These were labelled, and it was observed that a book containing by-laws numbering from 296 to 381 was missing.

This should be located at once and placed in safe keeping. By-law No. 945 was not written in the By-law Book and it is stated that the Bank holds the original by-law. A copy of this should at once be obtained and placed in its numerical order among the others.

By-laws are not indexed and all of those passed from the year 1900 to date had to be gone over before the particular ones governing the Judge's Creek Drain could be extracted.

List of these is appended and it will be noticed that the by-law striking the rates to be collected, gives but meagre information of the different purposes for which levy is to be made.

In future the Clerk should see that this delinquency is rectified, as all officials must fill their offices with zeal and punctiliousness, since the ratepayers depend on them to look after their interests and protect them from loss.

### CASH BOOKS AND CHEQUES.

Bank reconciliation at 13th January, 1913, is shown hereunder. All receipts have been deposited and no cash was on hand.

Cheques are entered in the Cash Book only after payment is made by the bank, and not when issued to the payee.

Outstanding cheques are not readily ascertainable and at the close of each year it is difficult to state what the Township's liabilities are in this direction. Checking all bank payments with the minute book and listing all "accounts passed for payment" for which cheques have not yet been paid, is necessary as no cheque stubs are kept.

Cheques, numerically numbered, in bound book form with stub attachment, should be instituted.

Treasurer should enter all cheques into the Cash Book in order of date as they are issued. At present the Cash Book presents a chaotic appearance as far as dates are concerned.

Cash Book will then show the cash in bank available for drawing on, and in reconciling this amount with the actual balance in the bank, the outstanding cheques will be listed.

Cheques for the year 1910 could not be found, so that the printed auditor's report for that year, along with the minute book, served for verification purposes.

Cheques are all signed by the Reeve, Clerk and Treasurer, but payee's endorsement is frequently missing, due no doubt to making cheques payable to bearer instead of to order.

### CASH BOOK RECONCILIATION AT 13TH JANUARY, 1913.

1913.			
Jan.	1.	Bank Balance, C.B. 114 .....	\$455 44
	13.	Receipts to date, C.B. 114 .....	2,814 20
	13.	Payments to date, C.B. 114 .....	\$3,007 39
	13.	Balance in bank, C.B. 114 .....	\$262 25
			<hr/>
			\$3,269 64      \$3,269 64

### BANK BOOK RECONCILIATION AT 13TH JANUARY, 1913.

1913.			
Jan.	13.	Bank Balance, per Pass Book .....	\$237 25
	25.	Deposit of Hall Rent cheque .....	25 00
		Bank Balance, per Cash Book, 114 .....	\$262 25
			<hr/>
			\$262 25      \$262 25

## RECOMMENDATIONS.

Ledger to be obtained and opened up from the Balance Sheet, prepared by the Auditors for 1912, and kept posted up thereafter, care to be taken that entries be made to the correct account.

Journal for entries other than Cash to be installed.

Vault arrangement should be made to keep all of the records safe from fire. Safe belonging to the Township is rented out, and as it is said to be of small dimensions, it would be of little use.

Drainage Rate Book must be obtained and written up to date. This book is to record Drainage By-laws passed, and the assessment against each lot, or part of lot, and where entered in the Collector's Roll.

Collector's Roll, all columns to be added and a complete summary of the page totals made.

Cheques to be entered in the Cash Book as issued and not as paid by the bank.

By-laws to be indexed.

Minutes to be paragraphed.

Debenture Register will be obtained and all of the outstanding issues written therein.

In conclusion the courtesies of the Reeve, J. H. Cook, and the Ex-Reeve, T. J. Bridge and W. B. Moshier are most gratefully acknowledged. The assistance of Ex-Clerk Wm. Laidlaw permitted a more intimate knowledge of the different proceedings than otherwise would have been possible.

All of which is respectfully submitted.

*Yours truly,*

OSCAR HUDSON,

*Chartered Accountant.*

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## TOWNSHIP OF EASTNOR.

## CONSTRUCTION ACCOUNT.

## RECEIPTS.

Jan. 25	To sale of Debentures under By-law 551, sold to G. A. Stimson & Co., C.B. 73 .....	\$10,000 00
	Premium on Debentures .....	5 00
	Accrued Interest, April 1, 1901, to January 23, 1902..	325 47
May 31	Interest on Balance in Bank, per Pass Book .....	28 25
Nov. 30 1903.	Interest on Balance in Bank, per Pass Book .....	19 40
Feb. 10	Interest on Loan to Municipality for other purposes, C.B. 86 .....	26 00
May 31	Interest on Balance in Bank, per Pass Book.....	22 60
Nov. 30 1904	Interest on Balance in Bank, per Pass Book.....	15 10
Jan. 11	Government Grant, C.B. 106 .....	2,480 00
29	Interest on Loan to Municipality for other purposes, C.B. 106 .....	42 32
Mar. 18 1906.	Interest on Balance in Bank, per Pass Book.....	4 52
Nov. 22	Sale of Debentures under By-law 756, sold to J. C. Eckford, C.B. 147 .....	2,800 00
	Premium on Debentures .....	4 00
	Accrued Interest to date of sale .....	102 88
1907.		
Dec. 31	Special Levy per By-law 822, to cover cost in excess of Estimates on Graham Ditch, constructed under By-law 756 .....	600 00

## EXPENDITURES.

1900.			
Dec. 31 1901.	By Construction Payments, per Schedule .....		\$250 35
Dec. 31 1902.	" " " " .....		6,246 19
Dec. 31 1903.	" " " " .....		966 58
Dec. 31 1904.	" " " " .....		4,165 86
Dec. 31 1905.	" " " " .....		2,569 44
Dec. 31 1906.	" " " " .....		80 93
Dec. 31 1907.	" " " " .....		1,127 26
Dec. 31 1912.	" " " " .....		611 00
Dec. 31	" Balance of Construction Moneys not expended....		457 93
		<u>\$16,475 54</u>	<u>\$16,475 54</u>

## THE JUDGES CREEK DRAINAGE SCHEME.

## LEVIES MADE AND DEBENTURES REDEEMED UNDER BY-LAW NO. 551 FOR THE YEARS 1902 TO 1912.

To Levy Collection Roll, 1902.....	\$903 99
" " 1903.....	849 13
" " 1904.....	873 34
" " 1905.....	859 38
" " 1906.....	856 85
" " 1907.....	879 11
" " 1908.....	864 63
" " 1909.....	889 05
" " 1910.....	873 03
" " 1911.....	876 94
" " 1912.....	735 89



By Debenture No. 1 and Coupons Redeemed, 1902, Mar. 25, C.B. 74	.....	\$735 82
"        2                    "        1903, Apl. 1, C.B. 86	.....	735 82
"        3                    "        1904, Apl. 1, C.B. 107	.....	735 82
"        4                    "        1905, Apl. 1, C.B. 125	.....	735 82
"        5                    "        1906, Apl. 4, C.B. 140	.....	735 83
"        6                    "        1907, Apl. 1, C.B. 5	.....	735 82
"        7                    "        1908, Mar. 17, C.B. 22	.....	735 83
"        8                    "        1909, Mar. 31, C.B. 35	.....	735 82
"        9                    "        1910, Mar. 30, C.B. 50	.....	735 82
"        10                   "        1911, Apl. 21, C.B. 71	.....	735 82
"        11                   "        1912, Apl. 1, C.B. 91	.....	735 82
By Overlevies for years 1902 to 1911	.....	1,367 30
		<hr/>
		\$9,461 34      \$9,461 34

## LEVIES MADE AND MAINTENANCE EXPENDITURES FOR THE YEARS 1904 TO 1912.

To Levy, Collector's Roll, 1904, By-law 664	.....	\$470 49
"        "        1907, no by-law	.....	907 29
"        "        1909, By-law 875	.....	297 30
"        "        1911, no by-law	.....	235 83
By Maintenance Payments, 1904, per schedule	.....	\$193 75
"        "        1905	.....	20 00
"        "        1906	.....	130 15
"        "        1907	.....	634 45
"        "        1908	.....	44 75
"        "        1909	.....	146 20
"        "        1910	.....	89 47
"        "        1911	.....	182 72
"        "        1912	.....	377 95
By Balance overlevied	.....	91 47
		<hr/>
		\$1,910 91      \$1,910 91

## LEVIES MADE AND DEBENTURES REDEEMED UNDER BY-LAW NO. 756, FOR THE YEARS 1906 TO 1912.

To Levy, Collector's Roll, 1906	.....	\$252 65
"        "        1907	.....	253 34
"        "        1908	.....	249 91
"        "        1909	.....	256 78
"        "        1910	.....	253 95
"        "        1911	.....	253 93
"        "        1912	.....	253 89
By Debenture No. 1 and Coupons Redeemed, Dec. 31, 1906, C.B. 2	.....	\$260 72
"        2                    "        Dec. 28, 1907, C.B. 19	.....	260 72
"        3                    "        Dec. 31, 1908, C.B. 32	.....	260 72
"        4                    "        Jan. 5, 1910, C.B. 50	.....	260 72
"        5                    "        Jan. 5, 1911, C.B. 71	.....	260 72
"        6                    "        Dec. 31, 1911, C.B. 91	.....	260 72
"        7                    "        Jan. 2, 1913, C.B. 114	.....	260 72
To Short Levies for years 1906 to 1912	.....	50 59
		<hr/>
		\$1,825 04      \$1,825 04

## TOWNSHIP OF EASTNOR.

## PAYMENTS ON ACCOUNT OF THE JUDGES CREEK DRAINAGE SCHEME IN YEAR 1900.

Date.	M.B. Folio.	Payee.	Services.	C.B. Construc- Folio. tion.
1900				
June 28	380	Cook, J. H.	Committee work re	
			Barrow Bay Drn.	41      \$ 75
July 8	400	Cook, J. H.	"	43      1 50
	400	Shouldice, Jas.	"	..      1 00
Aug. 8	405	Shouldice, Jas.	"	45      7 50
29	408	Cook, J. H.	"	47      4 55
	408	Armstrong, G. S.	"	..      4 45

Date.	M.B. Folio.	Payee.	Services.	C.B. Construc- Folio. tion.
1900.				
Nov. 29	420	Robertson, P. R. ....	Survey .....	49 \$7 50
	420	Brown, J. J. ....	" .....	6 00
	420	Shouldice, Jas. ....	" .....	6 00
	420	Shouldice, R. N. ....	" .....	3 75
	420	McKague, James ....	" .....	2 25
	420	Shouldice, R. ....	" .....	3 00
	420	Laidlaw, Wm. ....	" .....	9 75
	420	Cook, J. H. ....	" .....	8 00
Dec. 15	425	McDowall, R. ....	Surveying, plans, etc. ....	50 150 00
	420	Shouldice, John ....	Survey .....	2 25
	420	Anderson, Thos. ....	" .....	2 25
	420	Poore, David ....	" .....	1 35
	425	Cook, J. H. ....	Wiarton Trip re Dam .....	5 00
	425	Cook, J. H. ....	Survey .....	10 00
	425	Cooper, Peter ....	" .....	1 00
	425	McCutcheon, R. ....	Wiarton Trip re Dam .....	5 00
	420	Parker, Geo. ....	Survey .....	1 50
Dec. 15	425	Spotten, W. H. B. ....	Legal advice re Dam .....	50 3 00
Sept. 25	412	Ferguson, W. J. ....	Legal advice re Debentures .....	48 3 00
				\$250 35

## TOWNSHIP OF EASTNOR.

## PAYMENTS ON ACCOUNT OF THE JUDGES CREEK DRAINAGE SCHEME IN YEAR 1901.

Date.	M.B. Folio.	Payee.	Services.	C.B. Construc- Folio. tion.
1901				
Feb. 1	434	Cook, J. H. ....	Telegrams .....	54 \$ 50
	434	Cook, J. H. ....	Owen Sound Trip.. ..	9 50
Jan. 14	429	McIvor, D. ....	Telegrams .....	55 1 51
	437	Armstrong, G. S. ....	Wiarton Trip .....	5 30
	437	Ferguson, W. J. ....	Legal Advice .....	2 00
	437	Cook, J. H. ....	Wiarton Trip .....	5 30
Mar. 16	444	Robertson, Peter ....	Toronto Delegation ..	56 15 00
	444	Sloane, Dr. ....	" .....	15 00
	420	Gawley, A. ....	Survey .....	2 00
	444	Cook, J. H. ....	Toronto Delegation ..	18 00
	444	Hunter, J. ....	" .....	10 00
	447	Dalton, C. W. ....	Advertising for Tenders .....	4 00
	451	Moshier, W. B. ....	Telegrams .....	57 90
May 1	458	Cook, J. H. ....	Owen Sound Trip. ....	58 10 00
	458	Moshier, W. B. ....	" " " .....	10 00
	464	Cooper, Peter ....	Removing Dam ..	59 1 50
June 1	464	Prescott, Wm. ....	" " .....	1 50
	464	McCutcheon, R. ....	" " .....	2 50
	464	Tyndall, J. H. ....	" " .....	1 50
	464	Brown, J. J. ....	" " .....	1 50
	464	Cross, S. W. ....	Publishing By-law 551 .....	120 00
	464	Spotten, W. H. ....	Drafting By-law 551 .....	30 00
	464	Tyndall, J. H. ....	Removing Dam ..	4 50
July 2	470	Tyndall, Jos. ....	" " .....	60 15 00
	470	Shouldice, John ....	Survey .....	8 25
	470	Shouldice, Jos. ....	" .....	7 50
	470	Jenks, W. ....	" .....	7 50
	470	McCormack, Jas. ....	" .....	2 25
	470	Laidlaw, Wm. ....	" .....	1 00
	470	Moshier, W. B. ....	Overseeing Dam ..	2 00

Date.	M.B. Folio.	Payee.	Services.	C.B. Construc- Folio. tion.
1901.				
	470	Tyndall, J. H. ....	Removing Dam ..	\$3 00
	470	Brown, J. J. ....	Survey ..	9 10
	470	Brown, J. J. ....	Removing Dam ..	6 00
Aug. 1	478	Cook, J. H. ....	Work ..	61 6 00
	487	Chalmers, D. ....	Contract ..	62 900 00
28	487	Chalmers, D. ....	" ..	63 778 71
Sept. 7	483	McKay, Thompson ..	Legal ..	64 4 00
	483	Armstrong, G. S. ....	Wiarion Trip ..	4 30
	483	Cook, J. H. ....	" ..	4 30
Oct. 15	6	Chalmers, D. ....	Contract ..	65 600 37
	6	Chalmers, D. ....	" ..	500 00
	6	Brown, J. J. ....	Survey ..	85
	6	Johnston, Wm. ....	" ..	85
	6	Shouldice, Jas. ....	" ..	2 50
	6	Robertson, P. R. ....	" ..	85
Nov. 19	8	Dalton, C. W. W. ....	Copies By-law 551 Purchase of Dam	67 3 00
Dec. 10		Seaman, Hunter & Crawford..	B. L. 545 ..	2,000 00
		Seaman, Hunter & Crawford..	Accrued Int. ....	123 85
Dec. 16	15	Cook, J. H. ....	Re Debentures ..	68 5 00
	10	Cook, J. H. ....	Wiarion Trip ..	5 50
	X	Stewart, Wm., Snr. ....	Committee Work..	69 1 50
	15	Dalton, C. W. ....	Copy By-law ..	1 50
	X	Chalmers, D. ....	Contract ..	459 00
	17	Chalmers, D. ....	" ..	70 500 00
Apr. 3	451	Ferguson, W. J. ....	Legal Advice, De- bentures ..	57 3 00
Nov. 19	10	Ferguson, W. J. ....	Legal Advice, Flume	66 3 00
Aug. 26		Bank of Hamilton ..	Interest on note..	62 4 50
				\$6,246 19

## TOWNSHIP OF EASTNOR.

## PAYMENTS ON ACCOUNT OF THE JUDGES CREEK DRAINAGE SCHEME IN YEAR 1902.

Date.	M.B. Folio.	Payee.	Services.	C.B. Construc- Folio. tion.
1902				
Jan. 30	17	Union Bank .....	Interest on Notes.	73 \$126 97
30	17	Union Bank .....	Commission 1-16% on Debentures ..	6 47
Mar. 8	29	Chalmers, D. ....	Contract ..	587 42
	27	Armstrong, G. S. ....	Expenses ..	72 6 85
	17	McDowell, R. ....	Engineer ..	74 233 48
Apr. 28	37	Cook, J. H. ....	Services ..	75 3 00
Jan. 21	37	Can. Express Co. ....	Re Debentures ..	72 2 00
Feb. 8	27	Dalton, C. W. W. ....	Telegraphing ....	73 39
				\$966 58

1903

May 30	104	Cross, A. W. ....	Advertising ..	89 5 00
	104	Ferguson, W. J. ....	Legal Advice ..	2 00
July 31	118	Chalmers, David ..	Contract ..	92 766 34
Sept. 12	134	Chalmers, David ..	" ..	94 1,382 60
July 11	111	Bridge, T. J. ....	Work ..	92 1 00
Aug. 8	118	Brown, J. J. ....	" ..	94 75
Sept. 8	122	Bridge, T. J. ....	" ..	3 00
	122	Brown, J. J. ....	" ..	1 70
Oct. 21		Chalmers, D. ....	Contract ..	96 1,099 70
Dec. 1		Chalmers, D. ....	" ..	98 891 42
Sept. 19	122	Bridge, T. J. ....	Work ..	96 1 50
Dec. 26	157	Bridge, T. J. ....	Owen Sound Trip.	102 10 85
				\$4,165 86

## TOWNSHIP OF EASTNOR.

## PAYMENTS ON ACCOUNT OF THE JUDGES CREEK DRAINAGE SCHEME IN THE YEAR 1904.

Date.	M.B. Folio.	Payee.	Services.	C.B. Construc- Folio. tion.	Main- tenance.
Jan. 29	...	Chalmers, David .....	Contract .....	106 \$2,120 00	
	...	Chalmers, David .....	" .....	117 66	
Feb. 10	...	Union Bank .....	Interest on notes..	10 50	
	...	Union Bank .....	" .....	26 35	
Mar. 18	...	Union Bank .....	" .....	107 27 38	
June 11	185	Erb. C. W. ....	Livery re Govt. En- gineer .....	109	\$5 00
Aug. 8	250	Graham, Wm., Sr. ....	Cleaning out drains	112	25 00
	250	Sharp, Alex. ....	" " "		6 00
	250	Graham, Wm. ....	" " "		18 00
	250	Sharp, John .....	" " "		1 50
	250	Graham, Jas. ....	" " "		18 75
	250	Brady Web. ....	" " "		4 00
Nov. 12	274	Graham, Jas. ....	" " "	119	4 35
	274	Graham, Wm. Jr. ....	" " "		4 35
	274	Graham, Wm. Sr. ....	" " "		4 35
	274	Graham, Wm. Sr. ....	" " "		2 25
	274	Warren, D. S. ....	" " "		14 00
	281	Fox Joseph .....	" " "	122	16 50
Dec. 15	281	Brooks, J. F. ....	" " "		31 50
Nov. 12	274	Brooks, H. ....	" " "		3 00
	274	Brooks, W. E. ....	" " "		6 00
Dec. 15	281	Hewton, W. T. ....	" " "		18 00
	281	Brooks, W. E. ....	" " "		5 00
July 9	243	Norton, B. H. ....	Work, 1903 .....	110	5 20
July 9	243	Shaw, Wm. ....	Witness .....	110	1 65
	243	Graham Wm. ....	" .....		3 00
	243	Shouldice, Jas. ....	" .....		3 00
	243	Grant Rus. ....	" .....		3 00
	243	Shouldice, N. ....	" .....		3 00
	243	Morton, B. H. ....	" .....		2 25
	243	Bridge, T. J. ....	" and expenses ...	13 70	
	243	Dalton, C. W. ....	" .....	3 00	
	243	Sloane, Dr. J. G. ....	" .....	2 00	
	243	Warder, Wm. ....	" .....	3 70	
Aug. 8	253	Brown, J. J. ....	" .....	1 50	
	252	Lucas, Wright & McArdle ...	Solicitors .....	113 200 00	
	253	Jenks, W. ....	Witness .....	116 1 50	
	253	Jenks, W. ....	" .....	123 1 50	
Sept. 3	260	Cook, J. H. ....	" .....	116 3 00	
Oct. 1	269	McCutcheon, Robt. ....	" .....	117 1 50	
Sept. 3	260	Laidlaw, Wm. ....	Serving summons. ...	6 25	
Dec. 15	280	Reed, T. R. ....	Livery .....	119 14 00	
				\$2,569 44	\$193 75

## TOWNSHIP OF EASTNOR.

## PAYMENTS ON ACCOUNT OF THE JUDGES CREEK DRAINAGE SCHEME IN YEAR 1905.

Date.	M.B. 1905. Folio.	Payee.	Services.	C.B. Construc- Folio. tion.	Main- tenance.
Jan. 31	...	Sloane, Isabella .....	Interest on loan ..	124 \$14 50	
Feb. 15	...	Campbell .....	" .....	29 83	
Apr. 1	...	Union Bank .....	" .....	125 10 60	
Jan. 1	281	Fox, Jos. ....	Work, 1904 .....	124	\$3 00
Dec. 15	54	McCrae, Jas. ....	" 1905 .....	136	1 50
	54	Campbell, R. ....	" .....	135	5 25
	54	Parker, Wm. ....	" .....		2 25
	54	Parker, Geo. ....	" .....		2 25
	54	Parker, J. ....	" .....		1 90



Date.	M.B.		Services.	C.B. Construc-	Mainten-
1905.	Folio.	Payee.		Folio.	ance.
	54	Pettit, Wm. ....	Work, 1905 .....	.....	\$3 85
Oct. 9	44	McDowall, R. ....	Survey .....	132	11 50
Sep. 24	41	Morton, B. H. ....	" .....	3 50	
	41	Morton, Bruce .....	" .....	5 00	
	41	Laidlaw, Wm. ....	" .....	6 00	
				\$80 93	\$20 00

## TOWNSHIP OF EASTNOR.

## PAYMENTS ON ACCOUNT OF THE JUDGES CREEK DRAINAGE SCHEME IN YEAR 1906.

Date.	M.B.	Payee.	Services.	C.B. Construc-	Mainten-
1906.	Folio.			Folio.	ance.
Jan. 11		Union Bank .....	Interest on loan..	138	\$33 50
Dec. 15	54	Shouldice, James .....	Cleaning, 1905 ...	140	\$3 75
May 26	78	Lamont, R. ....	Inspection .....		2 00
	78	Williams, Chas. ....	" .....		2 00
	78	Moshier, W. B. ....	" .....		2 00
July 9	84	Cameron, R. ....	Work .....	142	7 50
Aug. 11	89	Drinkwater, Geo. ....	Livery .....	143	1 25
	90	Graham, S. ....	Survey .....		1 00
	90	Lamont, R. ....	" .....		4 00
	90	Rutherford, S. ....	" .....		3 75
	89	Mallard, D. C. ....	" .....		9 00
	90	Moshier, W. B. ....	Wiarion trip .....		7 50
	89	Graham, William .....	Survey .....		3 00
	89	Morton, B. H. ....	" .....	144	3 00
	90	Morton, B. H. ....	Work .....		2 25
	89	Tyndall, J. ....	" .....		3 00
	89	Smith, George .....	" .....		3 00
	90	Bridge, T. J. ....	" .....		3 00
Oct. 27	96	Graham, Wm. ....	Work .....	148	5 15
	97	Bridge, A. C. ....	" .....		7 00
Dec. 6	101	Morton, B. H. ....	" .....		15 00
	101	Graham, Wm. ....	" .....		9 00
	101	Campbell, D. ....	" .....		6 00
Dec. 15	101	Robertson, P. R. ....	Work .....	149	15 00
Oct. 27	96	Lamont, R. ....	" .....		7 00
Dec. 6	101	Lamont, R. ....	" .....		5 00
Sep. 15		Union Bank .....	Interest on loan ..		6 03
Dec. 1		Union Bank .....	" .....	176 65	
Nov. 22		Union Bank .....	" .....	5 10	
Graham Ditch.					
Sep. 15	95	Laidlaw & Shouldice .....	Contract .....	146	\$50 00
Nov. 14	100	" .....	" .....	147	30 00
Oct. 31	97	" .....	" .....		25 00
	97	" .....	" .....		25 00
Nov. 14	97	" .....	" .....	147	25 00
	100	" .....	" .....		30 00
	100	" .....	" .....	148	40 00
Dec.	104	" .....	" .....	2	125 00
Sep. 15	95	" .....	" .....	144	100 00
Sep. 21	95	" .....	" .....		300 00
Sep. 15	97	Bridge, J. ....	Dynamiting .....	146	19 50
Nov. 14	97	Butchart Bros. ....	Dynamite .....	147	21 75
Proportionate Cost of Issuing Debentures, B.L. 756.					
Mar. 8	67	Myers, J. H. ....	Debenture Work ..	139	\$1 25
	67	Moshier, W. B. ....	" .....	139	1 25
July 9	85	Wiarion Echo .....	Advg. Application..	142	3 12
		Whitlock, W. J. ....	Printing By-law ...		9 11
Apl. 17	72	Shaw & Scott .....	Solicitors' Services.	140	50 00
Dec. 15	103	Shaw & Scott .....	Solicitors' Services.	2	50 00
				\$1,127 26	\$130 15

## TOWNSHIP OF EASTNOR.

## PAYMENTS ON ACCOUNT OF THE JUDGES CREEK DRAINAGE SCHEME IN YEAR 1907.

Date.	M.B. Folio.	Payee.	Services.	C.B. Construc- Folio. tion.	Mainten- ance.
1907.					
Jan. 1	101	Bridge, A. C. ....	Work, 1906 .....	4	\$3 00
Sep. 14	136	Graham, Wm. ....	" 1907 .....	12	125 05
	140	Mallard, D. J. ....	Inspection .....		9 50
	136	Grant, R. ....	Work .....		29 00
	136	Shouldice, R. ....	" .....		45 50
Oct. 19	142	Lamont, R. ....	" .....	15	22 00
	142	Brown, Alf. ....	" .....		10 00
	142	Winch, S. ....	" .....		5 50
	141	Shouldice, R. ....	" .....		12 50
	140	Winch, S. ....	" .....		15 75
	137	Pacey, L. ....	" .....		14 40
	141	Rutherford, A. ....	" .....		38 50
	142	Campbell, D. ....	" .....		7 00
	142	McIntyre, Jas. ....	" .....		4 00
	141	Smith, Geo. ....	" .....		5 00
	142	Smith, Geo. ....	" .....		2 00
	140	McDonald, A. ....	" .....		21 00
	142	Graham, Wm. ....	" .....		3 50
	142	Tyndall, Jos. ....	" .....		8 00
	141	Morton, C. B. ....	" .....		8 40
	142	Grant, R. ....	" .....		12 00
	142	Morton, B. H. ....	" .....		14 40
	141	Pacey, L. ....	" .....		17 50
	142	Bray, Wm., Jun. ....	" .....		9 70
	141	Grant, R. ....	" .....		5 00
	141	Shouldice, R. ....	" .....		14 00
	142	Grant, R. ....	" .....		14 00
	141	Hill, F. ....	" .....		1 50
	142	Shouldice, R. ....	" .....		15 75
	142	Graham, Wm. ....	" .....	17	74 75
	146	Graham, Wm. ....	" .....		39 80
	146	Lamont, R. ....	" .....		3 25
	145	Morton, B. H. ....	" .....	19	3 20
Dec. 16	145	Tyndall, Jos. ....	" .....	17	20 00
		<i>Graham Ditch.</i>			
July 13	126	Graham, Wm. ....	" .....	6	9 00
	126	Lamont, R. ....	" .....		6 00
	126	McDonald, A. ....	" .....		6 00
Aug. 3	136	Laidlaw & Shouldice	Contract .....	10	100 00
" 31	136	" .....	" .....	12	100 00
Sep. 14	136	" .....	" .....	12	390 00
					611 00
					634 45
					\$611 00 \$634 45

## TOWNSHIP OF EASTNOR.

## PAYMENTS ON ACCOUNT OF THE JUDGES CREEK DRAINAGE SCHEME IN YEAR 1908.

Date.	M.B. Folio.	Payee.	Services.	C.B. Construc- Folio. tion.	Mainten- ance.
1908.					
Apl. 4	171	Moshier, W. B. ....	Work .....	23	\$2 50
	171	Cooper, S. C. ....	" .....	23	2 50
	171	Hatt, F. ....	" .....	23	3 00
	171	Hewton, W. T. ....	" .....	23	1 00
Sep. 18	192	Brown, Jos. ....	" .....	28	1 25
	192	Shaw, H. ....	" .....	28	5 00
	192	Stewart, H. ....	" .....	28	15 00
	192	Campbell, D. ....	" .....	28	7 25

Date.	M.B. Folio.	Payee.	Services.	C.B. Folio.	Construc- tion.	Mainten- ance.
1908.	192	Brown, A. ....	Work .....	28	\$2 25	
	192	Shaw, Robt. ....	" .....	28	5 00	
						<hr/> \$44 75
1909						
July 9	26	Jenks, Wallace .....	Cleaning out .....	35	\$1 50	
Aug. 13	30	Graham, Chas. ....	Work .....	42	3 60	
	30	Peer, H. ....	" .....	42	8 00	
	30	Cameron, R. ....	" .....	42	3 45	
	30	Parker, John .....	" .....	42	4 00	
	39	Jenks, George .....	" .....	42	9 00	
	30	Shaw, James .....	" .....	42	5 50	
	30	Scott, Enoch .....	" .....	42	5 50	
	30	Stewart, H. ....	" .....	42	1 00	
	30	Cook, J. H. ....	" .....	42	5 25	
	30	Bray, Jos. ....	" .....	43	1 35	
	30	Parker, Wm. ....	" .....	42	6 40	
Oct. 15	39	Baker, Wm., Jun. ....	" .....	46	3 25	
	39	Pacey, Ly. ....	" .....	42	1 50	
	39	Stewart, A. ....	" .....	42	10 00	
	39	Shaw, Chas. ....	" .....	42	16 50	
	39	Shaw, George .....	" .....	42	18 00	
	39	Wheeler, Wm. ....	" .....	42	6 75	
	39	Stewart, Hy. ....	" .....	42	20 50	
	39	Rogers, Jos. ....	" .....	46	15 15	
						<hr/> \$146 20

## TOWNSHIP OF EASTNOR.

## PAYMENTS ON ACCOUNT OF THE JUDGES CREEK DRAINAGE SCHEME IN YEAR 1910.

Date.	M.B. Folio.	Payee.	Services	C.B. Folio.	Mainten- ance.
1910.					
Jan. 4	67	Sharp, F. ....	Cleaning out .....	50	\$2 50
	67	Cook, J. H. ....	Trip .....	50	1 50
Sep. 10	83	Cook, J. H. ....	Work .....	62	1 00
	83	Hewton, W. T. ....	" .....	62	2 40
Oct. 12	83	Hewton, W. T. ....	" .....	62	1 50
Nov. 19	83	Campbell, D. ....	" .....	62	5 50
	83	Davis, Wm. ....	" .....	62	3 50
	83	Graham, Wm. ....	" .....	62	4 50
	83	Sharp, F. ....	" .....	62	4 50
	83	Hewton, W. T. ....	" .....	62	3 30
	83	Hewton, W. T. ....	" .....	62	2 90
Dec. 15	83	Hewton, W. T. ....	" .....	62	2 87
	83	Graham, Wm. ....	" .....	62	21 00
Nov. 19	83	Jenks, Wm. ....	" .....	68	1 00
Dec. 15	83	Sharp, F. ....	" .....	68	15 75
	83	Sharp, J. ....	" .....	68	75
	83	Dickie, J. A. ....	" .....	..	12 00
	83	Rogers, James .....	" .....	..	3 00
					<hr/> \$89 47

## TOWNSHIP OF EASTNOR.

## PAYMENTS ON ACCOUNT OF THE JUDGES CREEK DRAINAGE SCHEME IN YEAR 1911.

Date.	M.B. Folio.	Payee.	Services	C.B. Folio.	Mainten- ance.
1911.					
Jan. 1	106	Landon, W. S. ....	Inspection .....	79	\$1 50
	106	Stewart, H. ....	" .....	79	1 50
	106	Cook, J. H. ....	" .....	79	1 50
Aug. 11	113	Hewton, W. T. ....	" .....	79	1 00
Sep. 8	116	Graham, Wm. ....	Work .....	79	26 70

Date.	M.B. Folio.	Payee.	Services.	C.B. Folio.	Mainten- ance.
1911.					
	113	McKeachnie, A. ....	Work .....	79	\$7 50
	115	Hewton, W. T. ....	" .....	79	1 00
Aug. 11	114	Landon, N. S. ....	" .....	80	4 75
	113	Brown, Jos. ....	" .....	80	4 50
	113	Slocum, A. ....	" .....	80	9 00
	114	Brown, A. ....	" .....	80	1 30
	113	Poore, D. ....	" .....	80	6 75
	113	McKechnie, A. ....	" .....	80	3 00
	114	Peer, N. ....	" .....	80	2 00
	113	Jenks, W. ....	" .....	80	12 00
	113	Slocum, Alonzo .....	" .....	80	4 50
	113	Jenks, W. ....	" .....	80	4 50
Sep. 23	119	Blackwood, Wm. ....	" .....	82	13 50
Aug. 11	113	Richardson, H. ....	" .....	82	3 00
Oct. 20	122	Cook, J. H. ....	" .....	82	1 50
	128	Hewton, W. T. ....	" .....	82	1 50
Nov. 24	124	Hewton, W. T. ....	" .....	83	1 00
Aug. 11	113	Shouldice, Jas. ....	" .....	83	9 00
	122	Liverance, C. ....	" .....	83	8 75
	122	Liverance, J. ....	" .....	84	4 37
	122	Liverance, D. ....	" .....	84	4 37
	122	Robinson, H. ....	" .....	84	4 37
	122	Rogers, J. ....	" .....	84	12 00
	122	Harding, R. ....	" .....	84	6 12
	122	Sutter, R. ....	" .....	84	6 12
	122	Robinson, D. ....	" .....	84	4 00
	122	Harding, Jos. ....	" .....	84	2 62
	122	Peer, N. ....	" .....	84	3 00
Dec. 15	122	Hewton, W. T. ....	" .....	84	1 50
	128	Davis, Wm. ....	" .....	87	1 25
	128	Hatt, F. ....	" .....	87	75
Apl. 8	104	Cook, J. F. ....	" .....	72	1 00

\$182 72

## TOWNSHIP OF EASTNOR.

## PAYMENTS ON ACCOUNT OF THE JUDGES CREEK DRAINAGE SCHEME IN YEAR 1912.

Date.	M.B. Folio.	Payee.	Services.	C.B. Mainten- Folio. ance.
1912.				
Jun. 4	146	Campbell, E. ....	Cleaning out .....	91 \$ 75
	146	Robertson, B. ....	" .....	103 75
July 6	148	Robertson, J. ....	" .....	4 00
	148	Brown, J. ....	" .....	4 00
	148	Davis, Ed. ....	" .....	6 00
	148	Freckleton, Ed. ....	" .....	3 00
	148	Davis, Wm. ....	" .....	2 50
	148	Tyndall, J. T. ....	" .....	2 00
	148	Duke, Thos. ....	" .....	4 00
	148	Cook, J. H. ....	" .....	2 50
	148	Blackwood, S. ....	" .....	2 00
Aug. 3	155	Hatt, F. ....	" .....	11 60
	155	McKeachnie, A. ....	" .....	104 11 60
	155	Smith, G. ....	" .....	5 80
	155	Freckleton, Ed. ....	" .....	2 00
	156	Sharp, F. ....	" .....	10 00
	156	Duke, T., Snr. ....	" .....	10 00
	156	Wheeler, R. ....	" .....	4 00
	156	Duke, T., Jnr. ....	" .....	9 00
	157	Cook, J. H. ....	" .....	1 50
Sep. 7	159	Campbell, D. ....	" .....	2 00
	159	Robertson, J. ....	" .....	7 00
	159	Campbell, C. ....	" .....	3 00
	159	Cook, J. H. ....	" .....	3 00



Date.	M.B. Folio.	Payee.	Services.	C.B. Folio.	Mainten- ance.
1911.					
July 6	159	Graham, Wm	Cleaning out		\$16 00
	148	Rutherford, S. C.	" "	106	5 00
	148	Baker, Wm., Jr.	" "		2 00
Sep. 7	159	Robertson, Bruce	" "		7 00
	159	Smith, Geo.	" "		7 00
	159	Davis, E.	" "		5 60
	159	Davis, Wm.	" "		6 40
Sep. 24	164	Brown, J.	" "		3 00
	164	Graham, Wm.	" "		19 00
	164	Blackwood, J.	" "		23 00
Sep. 24	164	Blackwood, A.	Work		10 00
	164	Rutherford, H.	" "		5 00
	164	Perry, Wm.	" "		12 00
	164	Lindberg, H.	" "		4 00
	164	Cook, J. H.	" "	107	16 00
	164	Sharp, F.	" "		12 30
	164	Duke, Thos., Jr.	" "		7 70
	164	Blackwood, S.	" "		3 60
	165	Bray, Wm., Snr.	" "		29 00
Oct. 19	167	Hewton, W. T.	" "		8 00
	167	Campbell, D.	" "		3 00
	167	Campbell, C.	" "		2 00
	167	Hewton, H.	" "		1 00
	167	McKague, J.	" "		2 00
Sep. 24	164	Shouldice, N.	" "	110	1 00
	165	Jenks, W.	" "		1 00
Oct. 19	167	Blackwood, J.	" "		4 00
Nov. 9	171	Jenks, W.	" "		28 60
	171	Jenks, W.	" "		1 25
	171	Slocum, A.	" "		4 00
	171	Graham, Wm.	" "		3 00
	171	McKague, Jas.	" "		2 00
	171	Hewton, W. T.	" "		7 00
	171	Laidlaw, Wm.	" "		2 00
	171	Cook, J. H.	" "		2 50
					\$377 95

## TOWNSHIP OF EASTNOR.

## LOANS MADE IN CONNECTION WITH THE JUDGES CREEK DRAINAGE SCHEME AND THE REPAYMENTS THEREOF.

Date.		C.B. Folio.	Dr.	Cr.	Interest Accrued.
1901.					
July 27	Bank of Hamilton, Owen Sound, Note 9 mos. at 6% .....	62	.....	\$ 900 00	
Aug. 20	Union Bank, Wiarton, Note due Dec. 28, 1901 at 7% .....	62	.....	1,500 00	
Aug. 28	Union Bank, Wiarton, Note 4 mos. at 7% .....	63	.....	800 00	
Oct. 16	Union Bank, Wiarton, Note 75 days at 7% .....	65	.....	1,100 37	
Dec. 9	Union Bank, Wiarton, Note 18 days at 7% .....	67	.....	2,123 85	
Dec. 13	Union Bank, Wiarton, Note .....	69	.....	459 00	
Dec. 16	Cash Rebate from Funds of Judges Creek to recoup moneys pre- viously advanced .....	69	.....	600 00	
Dec. 24	Union Bank, Wiarton, Note 4 days at 7% .....	70	.....	500 00	
Aug. 26	Bank of Hamilton (1 mos. inter- est) .....	62	\$ 900 00	.....	\$ 4 50
Dec. 16	General Cash Account recoup for moneys advanced by Judges Creek Fund .....	69	600 00		

Date. 1902.		C.B. Folio.	Dr.	Cr.	Interest Accrued.
Jan. 30	Union Bank, Notes paid .....	73	6,359 37	.....	126 97
30	Union Bank, Notes paid .....	73	123 85	.....	
			<u>\$7,983 22</u>	<u>\$7,983 22</u>	<u>\$131 47</u>

## TOWNSHIP OF OF EASTNOR.

## LOANS MADE IN CONNECTION WITH THE JUDGES CREEK DRAINAGE SCHEME AND THE REPAYMENTS THEREOF.

Date.		C.B. Folio.	Dr.	Cr.	Interest Accrued.
1903.					
Oct. 21	Union Bank, Wiarton, Note 3 mos. at 7% .....	96	.....	\$1,099 70	
Dec. 1	Union Bank, Wiarton, Note .....	98	.....	891 42	
1904.					
Feb. 10	Union Bank, Note paid .....	106	\$ 891 42	.....	\$10 50
10	Union Bank, Note paid .....	106	1,099 70	.....	26 35
Jan. 7	Union Bank, Note given .....	106	.....	2,120 00	.....
Mar. 18	Union Bank, Note given .....	107	.....	946 21	
Apl. 1	Sloane, Isabella, Note given .....	107	.....	249 25	
1	Campbell, Alex., Note given .....	107	.....	486 57	
Mar. 18	Union Bank, Note paid .....	107	2,120 00	.....	27 38
Sep. 27	Union Bank, Note given .....	116	.....	425 00	
1905.					
Apl. 1	Union Bank, Note 9 mos at 6%... ..	125	.....	735 82	
1	Union Bank, Note paid .....	125	425 00	.....	10 60
Jan. 31	Sloane, Isabella, Note paid .....	124	249 25	.....	14 50
Feb. 15	Campbell, Alex. Note paid .....	124	486-57	.....	29 83
1906.					
Jan. 11	Union Bank, Note paid .....	138	735 82	.....	33 50
Sep. 15	Union Bank, Note discounted .....	144	.....	1,000 00	6 03
Dec. 1	Union Bank, Note paid .....	147	946 21	.....	176 55
Nov. 22	Union Bank, Note paid .....	147	1,000 00	.....	5 10
			<u>\$7,953 97</u>	<u>\$7,953 97</u>	<u>\$340 44</u>

## TOWNSHIP OF EASTNOR.

JUDGES CREEK DRAINAGE SCHEME DEBENTURE ISSUE OF \$10,000.00 UNDER BY-LAW No. 551,  
SOLD AT PAR TO G. A. STIMSON & COMPANY, IN JANUARY, 1902, AND THE REDEMPTION OF THE ANNUAL MATURING DEBENTURE AND INTEREST COUPONS.

Deb. No.	Due Date Month, Day, Year	Payable at	No. of In- terest Coupons	Amount of each Inter- est Coupon	Annual Levy Interest	Annual Levy Principal	Total Annually	Paid, Date	C.B.Fo.
		Union Bank, Warton							
1	April 1, 1902....		1	\$13 43	\$400 00	\$335 82	\$735 82	3/25/02	74
2	" 1, 1903....		2	13 97	386 57	349 25	735 82	4/1/03	86
3	" 1, 1904....		3	14 53	372 60	363 22	735 82	4/1/04	107
4	" 1, 1905....		4	15 10	358 07	377 75	735 82	4/1/05	125
5	" 1, 1906....		5	15 72	342 97	392 86	735 83	4/4/06	140
6	" 1, 1907....		6	16 34	327 25	408 57	735 82	4/1/07	5
7	" 1, 1908....		7	17 00	310 91	424 92	735 83	3/17/08	22
8	" 1, 1909....		8	17 68	293 91	441 91	735 82	3/31/09	35
9	" 1, 1910....		9	18 38	276 23	459 59	735 82	3/30/10	50
10	" 1, 1911....		10	19 12	257 85	477 97	735 82	4/21/11	71
11	" 1, 1912....		11	19 88	238 73	497 09	735 82	4/1/12	91
12	" 1, 1913....		12	20 68	218 85	516 98	735 83	.....	.....
13	" 1, 1914....		13	21 51	198 17	537 65	735 82	.....	.....
14	" 1, 1915....		14	22 37	176 66	559 16	735 82	.....	.....
15	" 1, 1916....		15	23 26	154 29	581 53	735 82	.....	.....
16	" 1, 1917....		16	24 19	131 03	604 79	735 82	.....	.....
17	" 1, 1918....		17	25 16	106 84	628 98	735 82	.....	.....
18	" 1, 1919....		18	26 17	81 68	654 14	735 82	.....	.....
19	" 1, 1920....		19	27 21	55 51	680 30	735 81	.....	.....
20	" 1, 1921....		20	28 30	28 30	707 52	735 82	.....	.....
					\$4,716 42	\$10,000 00	\$14,716 42		

## TOWNSHIP OF EASTNOR.

JUDGES CREEK DRAINAGE SCHEME DEBENTURE ISSUE OF \$2,800 UNDER BY-LAW No. 756,  
SOLD AT PAR TO J. E. ECKFORD IN NOVEMBER, 1906, AND THE REDEMPTION OF  
THE ANNUAL MATURING DEBENTURE AND INTEREST COUPONS.

Deb. No.	Due Date, Month, Day, Year	Payable at	No. of In- terest Coupons	Amount of each Inter- est Coupon	Annual Levy Interest	Annual Levy Principal	Total Annually	Paid, Date	C.B.Fo.
		Union Bank, Warton							
1	Dec. 31, 1906....		1	\$6 06	\$126 00	\$134 72	\$260 72	12/31/06	2
2	" 31, 1907....		2	6 34	119 94	140 78	260 72	12/28/07	19
3	" 31, 1908....		3	6 62	113 60	147 12	260 72	12/31/08	32
4	" 31, 1909....		4	6 92	106 98	153 74	260 72	1/5/10	50
5	" 31, 1910....		5	7 23	100 07	160 65	260 72	1/5/11	71
6	" 31, 1911....		6	7 55	92 84	167 88	260 72	1/31/11	91
7	" 31, 1912....		7	7 90	85 28	175 44	260 72	1/2/13	114
8	" 31, 1913....		8	8 25	77 39	183 33	260 72	.....	.....
9	" 31, 1914....		9	8 62	69 15	191 58	260 72	.....	.....
10	" 31, 1915....		10	9 01	60 52	200 20	260 72	.....	.....
11	" 31, 1916....		11	9 41	51 51	209 21	260 72	.....	.....
12	" 31, 1917....		12	9 84	42 09	218 63	260 72	.....	.....
13	" 31, 1918....		13	10 28	32 25	228 47	260 72	.....	.....
14	" 31, 1919....		14	10 74	21 97	238 75	260 72	.....	.....
15	" 31, 1920....		15	11 23	11 22	249 50	260 72	.....	.....
					\$1,110 81	\$2,800 00	\$3,910 81		

## TOWNSHIP OF EASTNOR.

REFUND OF LEVIES OVERCHARGED OF COLLECTORS' ROLL *re* BY-LAWS 551 AND 756.*Judges Creek Drainage Scheme.*

Date.	M.B.	Payee.	Services.	C.B.	Tax.
1903.	Folio.			Folio.	Refunds.
Jan. 1	73	Pettigrew, Jas. ....	Overlevy, Drain Rates, Lot 5, E 12.	85	\$3 01
Jan. 1	73	McCormack, S. ....	" Lot 1, E 18.	85	41
Jan. 1	73	Winch, W. ....	" Lot 6, E 16.	85	1 28
Feb. 7	85	Lamont, Robt. ....	" Lot 5, E 11.	86	4 69
Jan. 12	82	McKeachnie, S. ....	" Lot 4, E 5.	87	4 27
		Brook, J. F. ....	" Lot 5, E 18.	..	3 42
		Warren, Wm. ....	" Lot 5, E 19.	..	2 68
					<hr/>
					\$19 76
1906.					
Sept.	15	Knapp, Chas. ....	Overlevy, Drain Rates, Lot 2, E 2...	..	7 47
1910.					<hr/>
Jun.	14	Cameron, R. ....	Overlevy, Drain Rates, Lot 1, W 13.	..	3 13
					<hr/>
					3 13

## TOWNSHIP OF EASTNOR.

## BY-LAWS CONCERNING JUDGES' CREEK DRAINAGE SCHEME.

- By-law No. 545.—Authorising Reeve and Treasurer to borrow \$2,000, to pay Messrs. Hunter, Crawford & Seaman, Wlarton, for the right to remove the dam from Judges Creek.  
Dated 1 February, 1901.
- By-law No. 551.—To provide for drainage work in the Township of Eastnor, and for borrowing \$11,600 for completing the same.  
Dated March 16, 1901.
- By-law No. 553.—Confirming the agreement with contractor, David Chalmers, of Owen Sound.  
Copy of Agreement.  
Copy of Specifications.
- By-law No. 554.—Authorise the Reeve and Treasurer to borrow such monies as are required to meet expenditures in advance of debenture sale.  
Dated 2 July, 1901.
- By-law No. 559.—Amending By-law No. 554. The sums to be borrowed not to exceed \$10,000.  
Dated 7 September, 1901.
- By-law No. 583.—Reeve and Treasurer authorised to withdraw funds, consisting of proceeds of Debentures, as required, from Union Bank, Wlarton.  
Dated 28 June, 1902.
- By-law No. 586.—Levying Rates for 1902.  
Judges Creek Drainage as per By-law No. 551.  
Dated 27 September, 1902.
- By-law No. 619.—Levying Rates for 1903.  
Judges Creek Drainage as per By-law No. 551.  
Dated 5 September, 1903.
- By-law No. 637.—Appointing Lucas, Wright & McArdle, as Solicitors for Township in Chalmers' Suit.  
Dated 11 January, 1904.
- By-law No. 646.—Borrowing \$735.82 on note at 9 months to pay Debenture and Interest Coupons, until the rates can be collected.  
Dated 2 April, 1904.
- By-law No. 655.—Renewing note, \$946.00.  
Dated 8 August, 1904.
- By-law No. 658.—Sanctioning payment to William Shaw of \$65.00 for settlement of his claim for damages on Lot 19, Con. 1, East.  
Dated 3 September, 1904.



- By-law No. 664.—Levying Rates for 1904.  
Judges Creek Drainage as per By-law 551.  
Judges Creek Drainage Maintenance, \$470.00.  
Dated 1 October, 1904.
- By-law No. 688.—Authorising Reeve and Treasurer to borrow \$735.82 to pay Debenture and Interest Coupons, due 1 April, 1905.  
Dated 18 March, 1905.
- By-law No. 724.—Levying rates for 1905.  
No mention made of Judges Creek Debenture.  
Dated 9 October, 1905.
- By-law No. 738.—Reeve and Treasurer authorised to renew note due January 24, for \$1,067.93.  
Dated 8 January, 1906.
- By-law No. 745.—Appointing Alexander Chisholm and A. C. Bridge to audit the Judges Creek Drain Accounts.  
Dated 30 January, 1906.
- By-law No. 749.—Shaw & Scott, Barristers, Walkerton, appointed to arrange for the passing of a Special Act through Legislature for the ratification of further Debenture Issue.  
Dated 8 March, 1906.
- By-law No. 756.—To defray cost now outstanding, and to repay loans and advances in respect to the Judges Creek Drainage Scheme, by the further issue of Debentures of \$2,800.00.  
Dated 21 March, 1906.
- Schedule of yearly rates to be collected:—
- |                        |          |
|------------------------|----------|
| Ratepayers . . . . .   | \$203 11 |
| Municipality . . . . . | 50 78    |
| Total . . . . .        | \$253 89 |
- By-law No. 761.—Solicitors be empowered to take the necessary steps to procure the passage of a Special Act, confirming By-law 756, and others.  
Dated 17 April, 1906.
- By-law No. 774.—Appointment of N. E. Low, of Wiarton, as Engineer to undertake the construction of Graham Ditch, one of the sections of Judges Creek Scheme.  
Dated 30 July, 1906.
- By-law No. 777.—Specifications of Graham's Ditch.  
Dated 18 August, 1906.
- By-law No. 778.—Confirming Contract with Laidlaw & Shouldice for constructing Graham Ditch.  
Dated 18 August, 1906.
- By-law No. 784.—Levying Rates for 1906.  
Debentures paid according to Schedule.  
Dated 15 September, 1906.
- By-law No. 812.—Reeve and Treasurer authorised to borrow \$200.00 for the purpose of cleaning out certain portions of the drain.  
Dated 13 July, 1907.
- By-law No. 815.—Borrow \$500.00 from Union Bank, to complete the construction of Graham Ditch.  
Dated 3 August, 1907.
- By-law No. 820.—Levying Rates for 1907.  
Drainage Rates according to Schedules.  
No mention of Special Rate for Maintenance.  
Dated 3 August, 1907.
- By-law No. 822.—Amending By-laws 551 and 756.  
Raising \$600.00 to pay for increased cost of constructing Graham Ditch, by assessment and levy upon the lands and roads liable therefor.  
Dated 16 December, 1907.
- By-law No. 850.—Levying Rates for 1908.  
Debenture Rates to be levied as per Schedule.  
Dated 14 August, 1908.
- By-law No. 875.—Levying Rates for 1909.  
Debenture Rates as Schedule.  
Special levy for Maintenance of \$250.00.  
Dated 10 September, 1909.

- By-law No. 900.—Levying Rates for 1910.  
Debenture Rates as Schedule.  
Dated 6 August, 1910.
- By-law No. 920.—Levying Rates for 1911.  
Debenture Rates as per Schedule.  
No mention of Special Rate for Maintenance.  
Dated 30 September, 1911.
- By-law No. 946.—Amending By-law 551. Reduction of annual levy to \$735.82, being the amount correctly required to meet annual Debenture and Interest Coupons.  
Dated 19 October, 1912.
- By-law No. 947.—Levying Rates for 1912.  
By-law 551 amended, Debenture Rate.  
By-law 756, Debenture Rate.  
Dated 19 October, 1912.

### TOWNSHIP OF EASTNOR, COUNTY OF BRUCE.

#### EXTRACT FROM MINUTES OF THE TOWNSHIP CONCERNING THE JUDGES' CREEK DAMAGE SCHEME.

- Aug. 29, 1900. Petition presented by G. S. Armstrong and forty-five ratepayers read.  
M. B. Fo. 408. Civil Engineer to be employed to survey and assess lands in drainage area. Employ sufficient men to assist engineer.
- Oct. 1, 1900. Grant of \$300 to be made to Hunter, Crawford and Seaman conditionally on the permanent removal of the present dam and flume across Judges Creek at Barrow Bay; also an agreement to be given that any new dam erected shall be on the east side of the present long slide, and not to be built higher than ten feet below the level of the bottom of the present dam. Providing Council has power to make grant and charge said amount to the drainage scheme.  
M. B. Fo. 414.
- Nov. 29, 1900. Orders issued on the Treasurer re Survey.  
M. B. Fo. 420.  
M. B. Fo. 422. Reeve Cook, and Messrs. R. Cutcheon and G. S. Armstrong appointed to wait on Messrs. Hunter, Crawford and Seaman and endeavor to get a written agreement from them respecting amount of purchase money required by them for their right of the present dam on Judges Creek.
- Dec. 15, 1900. Committee report that Messrs. Hunter, Crawford and Seaman require the sum of \$2,000.00 for their rights of the dam, the offer to expire 10th February, 1901.  
M. B. Fo. 424.  
M. B. Fo. 425. Orders issued on Treasurer.
- Jan. 14, 1901. Reeve authorized to consult R. McDowell, P.L.S., Owen Sound, about the removal of the dam at Barrow Bay and cost of the same, and get legal advice before acceptance of Messrs. Hunter & Crawford offer.  
M. B. Fo. 428.
- Feb. 1, 1901. Reeve reported having seen Mr. McDowell, P.L.S., Owen Sound, re removal of dam at Barrow Bay. Mr. McDowell stated in his opinion the Council had the power to add the sum of \$2,000.00, being the amount that Messrs. Jas. Hunter, Crawford & Seaman agreed to accept from the Council for the right to remove the dam, owned by them on Judges Creek, they agreeing to remove the flume, although the sum in his opinion was excessive. The Council were to add to the assessment on each lot interested pro rata the additional sum of \$1,600.00 to his original allowance for the removal of said dam and that this sum was to be considered as part of his original report and estimates re drainage of Judges Creek.  
M. B. Fo. 430.
- M. B. Fo. 431. That Council accept offer of Messrs. Hunter, Crawford and Seaman, of Wiarton, of December 1, 1900, and pay them \$2,000. Reeve authorized to have matters legally attended to, and By-law passed to carry out instructions.
- Feb. 1, 1901. Accounts passed for payment.  
M. B. Fo. 434. By-law No. 545 passed to authorize the Reeve and Treasurer to borrow \$2,000 re dam.

- Feb. 16, 1901.  
M. B. Fo. 435. Clerk reported that he had notified all the parties interested in the proposed drainage scheme to attend this meeting of the Council if they intended having their names taken off the petition, or apply to have fresh names added.
- M. B. Fo. 436. Council met after adjournment. No applications received to have names added or taken off petition. Engineer's report and other correspondence read to the ratepayers interested present. Council adopts Engineer's report, Plan and Specifications for the further drainage of Judges Creek, and a By-law drafted and read a first and second time. Clerk to notify the Engineer, Mr. R. McDowell, to attend Court of Revision, re drainage scheme.
- M. B. Fo. 437. Account passed for payment.  
Delegates appointed to wait on Government re grant to Judges Creek: J. H. Cook, F. McPherson, J. G. M. Sloane, M.D., B. B. Miller, and Jas. Wamsley.
- Mar. 16, 1901.  
M. B. Fo. 438. Court of Revision held to go into appeals against assessment for drainage work.  
M. B. Fo. 439 to 443. Containing changes of Court.
- M. B. Fo. 444. By-law read second and third time and signed and sealed.  
Accounts passed for payment.
- Mar. 23, 1901.  
M. F. Fo. 445. Reeve appointed to see Mr. S. W. Cross regarding advertising By-law No. 551.  
M. B. Fo. 447. Clerk instructed to insert advertisements in Toronto and Wiarton papers re tenders for the construction of the drain.  
Accounts passed for payment.
- M. B. Fo. 448. Committee appointed to settle S. W. Cross' account for advertising re Judges Creek.
- Apr. 3, 1901.  
M. B. Fo. 449. Account of S. W. Cross left unsettled.  
Contractors tendering on the drainage construction will furnish two bondsmen joined with himself.
- M. B. Fo. 450. Council to memorialize Hon. Oliver Mowat, Lieutenant-Governor of Ontario, for aid in Judges Creek Drainage Scheme under the provisions of the Municipal Drainage Aid Act.
- Apr. 8, 1901.  
M. B. Fo. 450. Mr. Moshier and Reeve and Clerk be appointed to prepare specifications as to contract of Judges Creek.  
M. B. Fo. 451. Accounts passed for payment.
- Apr. 20, 1901.  
M. B. Fo. 452. Court of Revision held to settle two other assessments left over from last meeting.  
M. B. Fo. 453. Clerk to notify Hunter, Crawford and Seaman, Wiarton, that dam will be removed on the 1st of May, 1901.
- M. B. Fo. 454. Clerk reported several tenders for construction of drain. David Chalmers' tender accepted if he will construct the drain at the Engineer's estimate. If David Chalmers will not construct at this amount his price on the tender will have to be accepted. Clerk instructed to employ W. J. Ferguson, Solicitor, to prepare agreement between contractor and Township.
- M. B. Fo. 455. Reeve and Mr. Moshier appointed to go to Owen Sound to see the Engineer, R. McDowell, P.L.S., respecting specifications and get an agreement drawn up between Contractor and Municipality.
- May 1, 1901.  
M. B. Fo. 457. Special meeting called to ratify agreement with David Chalmers.  
Clerk and Reeve authorized to sign agreement.
- June 1, 1901.  
M. B. Fo. 463. Accounts passed for payment.  
M. B. Fo. 464.
- July 2, 1901.  
M. B. Fo. 465. Mr. James Shouldice notified Council that he objected to the manner in which the dirt was taken out of the ditches by David Chalmers was disposed of.



- M. B. Fo. 467. Objections received from S. McCormick and James Rodgers as to the course of the drain.
- M. B. Fo. 469. Reeve and Treasurer authorized to borrow money to carry on the work of constructing the drain until the debentures were sold.
- M. B. Fo. 470. Accounts passed for payment.
- Aug. 1, 1901 . Clerk and Treasurer instructed to prepare a statement showing how much money has been advanced to Judges Creek Drainage Improvement out of general funds of the Municipality.
- M. B. Fo. 476.
- M. B. Fo. 477. Reeve to arrange with David Chalmers to spread the dirt taken from ditches on the roadways.
- M. B. Fo. 478. Account passed.
- Sept. 7, 1901. Reeve reported seeing Mr. McDowell re certain disputes concerning Judges Creek, and the Engineer certified that the contractor was entitled to be allowed 50c. per rod for grubbing and spreading dirt.
- M. B. Fo. 479.
- M. B. Fo. 480. David Chalmers, contractor, applied for extra allowance for grubbing along the minor ditches. Council allow contractor extra allowance for spreading dirt.
- M. B. Fo. 481. By-law No. 554 amended by fixing the amount to be borrowed from the bank at \$10,000.
- M. B. Fo. 483. Accounts passed for payment.
- Sept. 16, 1901. Letter from David Chalmers refusing offer of Council re grubbing and spreading dirt. Council wire and refuse any higher price.
- M. B. Fo. 486.
- M. B. Fo. 487. Accounts passed for payment.
- Oct. 15, 1901. Reeve authorized to obtain legal advice re drain.
- M. B. Fo. 2.
- M. B. Fo. 3. On advice of Engineer Mr. McDowell, the contractor, be allowed 50c. per rod for grubbing along certain roads.
- M. B. Fo. 6. Accounts passed for payment.
- Nov. 19, 1901. Letter received from W. J. Ferguson, Solicitor, re flume at Barrow Bay, containing advice. Clerk instructed to notify Seaman, Hunter & Crawford that the Council object to them using road allowance.
- M. B. Fo. 8. Accounts passed for payment.
- M. B. Fo. 11. Reeve Cook reported that he was making arrangements to issue \$10,000 of Judges Creek Drainage Debentures at an early date.
- Dec. 16, 1901. Accounts passed for payment.
- M. B. Fo. 15.
- Dec. 30, 1901. Accounts received from Engineer R. McDowell and Contractor David Chalmers.
- M. B. Fo. 16.
- M. B. Fo. 17. Notice from Manager Union Bank asking to have all notes renewed re Judges Creek, amount of notes, \$6,568.37, with interest at 7% for thirty days.
- Notice from G. A. Stimson, Broker, Toronto, stating that he would take the \$10,000 of Judges Creek Debentures at 4%, less \$5.00, and he would send debentures to be signed in a few days.
- Accounts passed for payment.
- Feb. 8, 1902. David Chalmers, account to be paid after estimate of work done has been received from engineer.
- M. B. Fo. 23.
- M. B. Fo. 26. David Chalmers notified that dredge may injure bridge during spring freshet.
- M. B. Fo. 27. Account passed for payment.
- Mar. 8, 1902. Account passed for payment.
- M. B. Fo. 29.
- June 28, 1902. Reeve and Treasurer authorized to draw from Union Bank when necessary out of Drainage Fund.
- M. B. Fo. 48.
- Sept. 27, 1902. Striking Rates, Estimates. Municipality, 4-10 mill for drain. Drain
- M. B. Fo. 65. ratepayers per By-law 551.



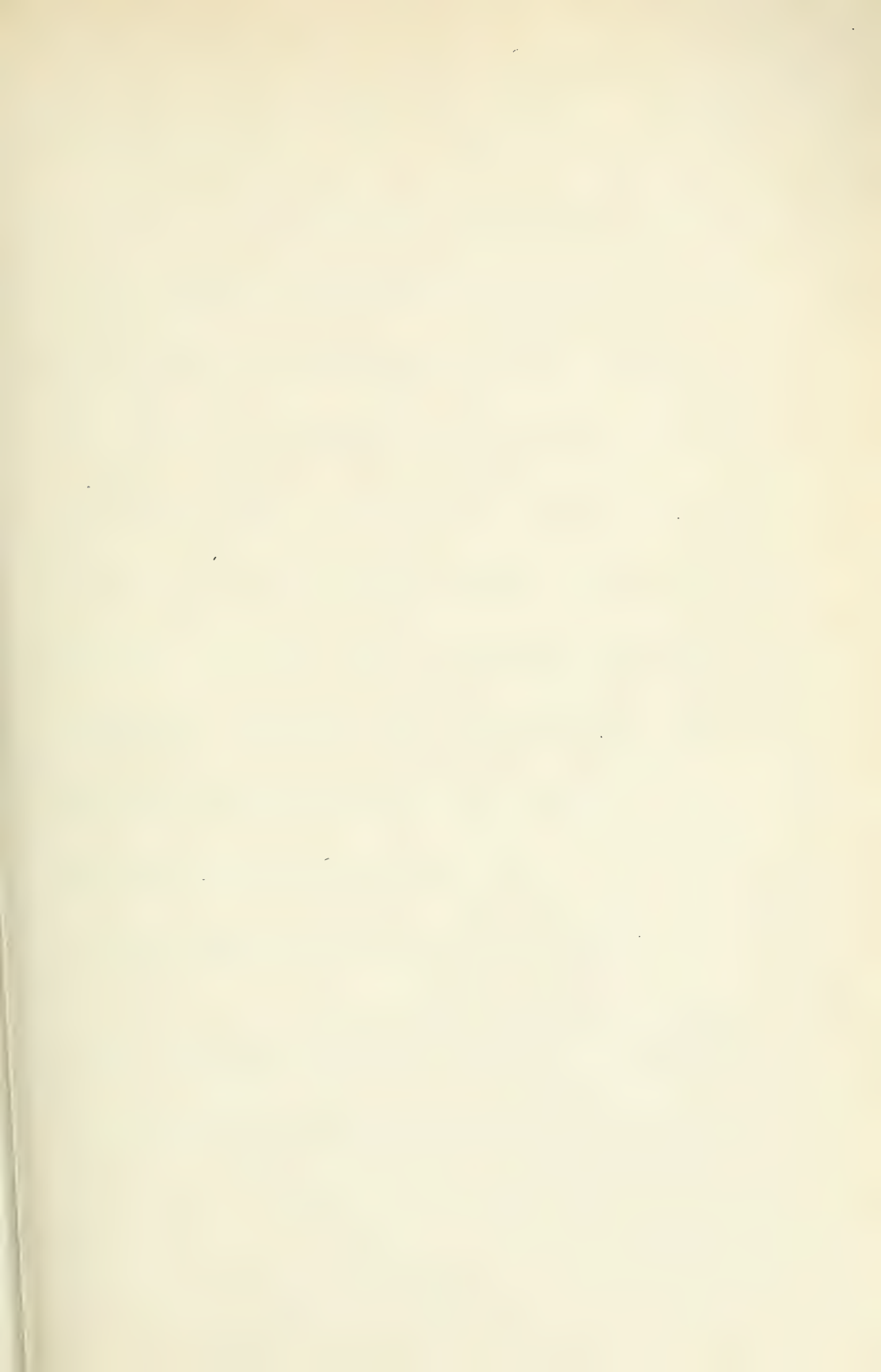
Dec. 15, 1902. M. B. Fo. 75.	Reeve instructed to get advice from a solicitor as to contract of David Chalmers. Letter read from W. Edwards, Esq., Sec. Public Works, Ont., re inspection of Judges Creek Drainage Works.
May 2, 1903. M. B. Fo. 94.	Clerk instructed to notify David Chalmers to start work on the drain at once.
May 30, 1903. M. B. Fo. 104.	Accounts passed for payment.
July 11, 1903. M. B. Fo. 109.	Clerk instructed to request Engineer, R. McDowell, to inspect drain at an early date.
M. F. Fo. 111.	Account passed for payment.
Sep. 5, 1903. M. B. Fo. 120.	Clerk instructed to write to Engineer, Mr. R. McDowell, regarding addition of certain ditches to the drainage scheme.
M. B. Fo. 122.	Accounts passed for payment.
Sept. 19, 1903. M. B. Fo. 135.	Reference to By-law striking rate, levy for Debenture By-law No. 551. Municipality By-law No. 551.
Oct. 24, 1903. M. B. Fo. 142.	Mr. N. Peer request change in course of drain on Con. 1 W. across lot 12; Clerk instructed to write foreman in charge of work to change course.
M. B. Fo. 141.	Letter from D. Robertson, Solicitor re claim Wm. Shaw for damages re diagonal drain.
Dec. 15, 1903. M. B. Fo. 149.	Clerk instructed to acknowledge David Chalmers' statement of account, with bill for damages, and notify him that the matter will be left over for the new Council to attend to. Reeve advised to obtain legal advice re damages claimed by David Chalmers, also on the responsibility for change of ditch on Lot 19, Con. I.E.
Dec. 26, 1903. M. B. Fo. 154.	Reeve reported seeing the contractor, David Chalmers, re his claim for alleged damages and extras and had made offer of \$500.00 as a full settlement for all claims, which was refused by the contractor, there still being a difference of \$2,000 between them. He further stated that he had placed the matter in the hands of Lucas & Wright, Solicitors, to attend to, if the contractor proceeded further with his claim.
M. B. Fo. 156.	Council does not consider that contractor has completed his work re Lot 19. T. J. Bridge & G. S. Armstrong appointed to see what amount was still owing to contractor and settle the same.
Jan. 11, 1904. M. B. Fo. 158.	Letter of legal advice read from Lucas, Wright and McArdle, Barristers, Owen Sound, re David Chalmers.
M. B. Fo. 159.	Letter read from Wm. Edwards, Esq., Dep't. Public Works, that cheque for \$2,480.00 had been issued as a grant to the Judges Creek Drainage scheme. Reeve to notify Lucas & Wright that they are retained by the Township and ask for advice re liability of contractor re Lot 19.
M. B. Fo. 161.	Lucas & Wright retained by Council for the expected action of David Chalmers, and By-law passed.
Mar. 5, 1904. M. B. Fo. 168.	Mr. R. McDowell be instructed to examine the entire Judges Creek Drainage Works.
Apr. 2, 1904. M. B. Fo. 172.	Reeve stated that Debenture of Judges Creek Drain was due and no money on hand to redeem it. By-law drafted to borrow \$735.82 from bank to pay off debenture.
May 14, 1904. M. B. Fo. 178.	Mr. Wm. Graham applied to have the drain at the rear of his lots surveyed, it being part of the Judges' Creek Drainage. Clerk to instruct Mr. R. McDowell, C.E., to lay course of the ditch on Con. 3 E., from Lot 5 to Lot 11, which section has been cancelled by him.

- July 9, 1904. Accounts passed for payment:  
M. B. Fo. 243.  
Aug. 8, 1904. That the sum of \$65.00 be paid to Mr. Wm. Shaw, in full settlement of  
M. B. Fo. 252. his claim for alleged damages to Lot 19, Con. 1 E., for a Diagonal  
Drain crossing said lot providing that Wm. Shaw consents to said  
remaining part of the Judges Creek Drainage Scheme.
- Oct. 1, 1904. Account passed for payment.  
M. B. Fo. 269.  
Aug. 8, 1904. Account of Lucas, Wright & McArdle, Solicitors of Owen Sound re D.  
M. B. Fo. 252. Chalmers be paid, having been reduced from \$240.00 to \$200.00.  
M. B. Fo. 253. Reeve and Treasurer authorized to either borrow or recommend debentures to be sold to cover the Judges Creek Drainage note of \$946.00 and others.  
Accounts passed for payment:
- Sept. 3, 1904. Accounts passed for payment:  
M. B. Fo. 260.  
Sept. 24, 1904. Jos. Fox instructed to deepen ditch in front of Lots 18 and 19, Con.  
M. B. Fo. 266. 4, E., in accordance with Judges' Creek Drainage Specifications.
- Oct. 1, 1904. Striking rates, per By-law, special \$470.00.  
M. B. Fo. 269.  
Dec. 15, 1904. Accounts passed for payment.  
M. B. Fo. 281.  
Feb. 4, 1905. Reeve Dr. Sloane and Treasurer appointed to report on the financial  
M. B. Fo. 9. standing of the drains in township.  
Sept. 14, 1905. Accounts passed for payment.  
M. B. Fo. 41.  
Oct. 9, 1905. Striking rate, Township, \$171.50.  
M. B. Fo. 46.  
Dec. 15, 1905. Accounts passed for payment.  
M. B. Fo. 54.  
Jan. 8, 1906. Reeve and Clerk authorized to examine the papers in the press in the  
M. B. Fo. 59. Township Hall, to destroy the useless rubbish and classify the  
balance.  
M. B. Fo. 60. Note renewed; Judges Creek Drainage. Old note Jan. 24th, 1906,  
\$1,067.93.
- Jan. 29, 1906. Auditors appointed to examine the Treasurer's books in connection  
M. B. Fo. 62. with the Judges Creek Drainage Scheme.
- Mar. 8, 1906. Reeve and Treasurer authorized to borrow \$735.00 from Union Bank  
M. B. Fo. 66. to pay the Judges Creek Debenture, falling due April 2, 1906.
- Mar. 21, 1906. By-law 756 to authorize issue of debentures to defray costs now out-  
M. B. Fo. 68. standing of the work known as Judges' Creek Drainage Scheme be  
read.  
Solicitor instructed to take steps to procure the passage of a special  
act at the present session of the Legislature to confirm By-law 756  
and others, and the assessment made thereby, and to authorize the  
Corporation to issue debentures.  
Accounts passed for payment.
- July 9, 1906. Action of R. E. McDowell in the Judges Creek matter was discussed.  
M. B. Fo. 84. Former By-law appointing Township Engineer for Eastnor be repealed  
July 30, 1906. and N. E. Low, of Wiarton, be appointed Engineer to undertake the  
M. B. Fo. 86. construction of certain portions of Judges Creek Scheme.  
W. B. Moshier and R. Lamont appointed to attend survey.  
Mr. W. B. Moshier appointed to accompany Mr. Mallard to Wiarton to  
interview N. E. Low, Engineer re proposed Graham ditch on Judge  
Creek Drainage Scheme.
- Aug. 11, 1906. Re dimensions and specifications of Graham ditch.  
M. B. Fo. 88.  
M. B. Fo. 89. Tenders discussed.  
Tenders not accepted and new ones called for.  
M. B. Fo. 90. Accounts passed for payment.

- Aug. 19, 1906. Tender of Laidlaw & Shouldice *re* Graham ditch be accepted at \$2.25  
M. B. Fo. 91. per rod. Directions how work to be accomplished.
- Sept. 15, 1906. Striking rate; Municipality .75 mills for all Debentures, and rate-  
M. B. Fo. 93. payers according to schedules.  
Reeve and Clerk authorized to issue all orders on the Treasurer for  
work done by Laidlaw & Shouldice.  
Reeve and R. Lamont appointed inspectors of Graham ditch.  
M. B. Fo. 95. Accounts passed for payment.
- Dec. 15, 1906. Refund of Assessment, Knapp, Chas.  
M. B. Fo. 104. Payment to Shouldice & Laidlaw.
- May 25, 1907. Communication from Shaw & Scott was read regarding claim of dam-  
M. B. Fo. 121. ages made by Hiram Shouldice in the matter of the Judges Creek  
Drainage Scheme.  
Council not to take any action.
- June 15, 1907. Hiram Shouldice interviewed the Council *re* claim for damages, and  
M. B. Fo. 123. the further cleaning out of certain portions was found necessary.
- July 13, 1907. Several letters from Robertson and McNab from Shaw & Scott, of  
M. B. Fo. 125. Walkerton, regarding the Shouldice case.  
R. Lamont appointed to look after cleaning out Judges Creek.  
Laidlaw & Shouldice notified to spread the earth removed from ditch  
on the 10th sideroad and complete ditch according to specifications.  
M. B. Fo. 126. Accounts passed for payment.
- Aug. 3, 1907. Reeve and Clerk authorized to issue orders to Messrs. Shouldice &  
M. B. Fo. 130. Laidlaw as work on Graham ditch is proceeded with.  
M. B. Fo. 131. Treasurer granted necessary power to raise \$500.00 for payment of the  
completion of Graham ditch.  
Rates to be levied for year.  
Sept. 14, 1907. Accounts passed for payment.
- Jan. 13, 1908. Auditors appointed, J. H. Cook and T. J. Bridge for 1907, and as special  
M. B. Fo. 150. Auditors to audit the Judges Creek Drainage Scheme and prepare  
statement of same.
- Feb. 15, 1908. Auditors presented report *re* Judges Creek.  
M. B. Fo. 156. Accounts passed for payment.
- Apr. 4, 1908. Striking rate, Debentures per schedule.  
M. B. Fo. 171. Accounts passed for payment.
- Apr. 14, 1908. Accounts passed for payment.  
M. B. Fo. 188. Laidlaw & Shouldice notified to spread the earth removed from ditch  
on the 10th sideroad and complete ditch according to specifications.  
Sept. 18, 1908. Accounts passed for payment.  
M. B. Fo. 192. Accounts passed for payment.
- July 9, 1909. Resolution *re* By-law striking rates.  
M. B. Fo. 26. Clerk authorized to levy the sum of \$250.00 on Judges Creek to meet  
Sept. 10, 1909. current expenses on that stream.  
M. B. Fo. 35. Accounts passed for payment.
- M. B. Fo. 36. Accounts passed for payment.
- Oct. 15, 1909. Appointed Mr. Eli Warder Township Engineer of Ditches and Water-  
M. B. Fo. 39. courses.  
Apr. 9, 1910. Accounts passed for payment.  
M. B. Fo. 59. Accounts passed for payment.
- June 4, 1910. Mr. Wm. Young appointed Township Engineer in place of Mr. Eli  
M. B. Fo. 67. Warder, resigning.  
Accounts passed for payment.
- Aug. 6, 1910. Resolution *re* By-law striking rates.  
M. B. Fo. 76. Accounts passed for payment.
- Sept. 10, 1910. Accounts passed for payment.  
M. B. Fo. 83. Accounts passed for payment.

- Apr. 28, 1911. Petition to appoint engineer to examine and report on improvements, alterations and extensions of the Judges Creek Drainage, by Messrs. M. B. Fo. 102. Perry, Bridge & Laidlaw given six months' hoist.
- M. B. Fo. 103. R. E. Moore appointed Engineer of Ditches and Watercourses.
- M. B. Fo. 104. Accounts passed for payment.
- June 1, 1911. Accounts passed for payment.
- Sept. 23, 1911. Resolution *re* By-law striking rates.
- M. B. Fo. 118. Accounts passed for payment.
- M. B. Fo. 119. Accounts passed for payment.
- July 6, 1912. W. E. Brooks appointed to the Township in place of R. E. Moore, deceased.
- M. B. Fo. 148. Accounts passed for payment.
- Aug. 3, 1912. Letter from Mr. Cooper *re* Judges Creek Drain.
- M. B. Fo. 153. Letter from Mr. T. J. Bridge.
- M. B. Fo. 155. Accounts passed for payment.
- Sept. 7, 1912. Letter from S. C. Cooper per R. & McN. *re* Judges Creek read.
- M. B. Fo. 158. By-law No. 551 to be amended so that right amount be levied each year.
- W. T. Hewton authorized to clean out Judges Creek Drain from the 10th sideroad to the 1st concession.
- M. B. Fo. 159. J. H. Cook continue cleaning out ditch on 2nd and 3rd concession up to the 5th sideroad.
- Resolution *re* striking rates.
- Accounts passed for payment.
- Oct. 19, 1912. Letter from Robertson & McNab *re* Judges Creek.
- M. B. Fo. 166. Moved by W. T. Newton, seconded by W. J. Walpole, that the Clerk write to the Provincial Auditor and see about getting Judges Creek Scheme audited and report to the Reeve and Mr. Stewart.
- M. B. Fo. 167. Accounts passed for payment.
- Nov. 9, 1912. Moved by W. T. Newton, seconded by Hy. Stewart, that the Clerk write to the Provincial Auditor to send a man up to audit the Judges Creek Scheme, say at the price mentioned, \$8.00 per day and all expenses.
- M. B. Fo. 170. Accounts passed for payment.
- M. B. Fo. 171. Accounts passed for payment.













20	3 43	3 43	3 43	3 43	3 43	3 45	3 43	3 43	3 43	3 43	3 43	3 43	2 87
21	1 72	1 72	1 72	1 72	1 72	1 72	1 72	1 72	1 72	1 72	1 72	1 44	2 87
6 E.	13	2 59	2 59	2 59	2 59	2 59	2 59	2 59	2 59	2 59	2 59	2 16	2 16
14	2 99	2 99	2 99	2 99	2 99	3 06	2 99	2 99	2 99	2 99	2 99	2 51	2 51
15	2 19	2 19	2 19	2 19	2 19	2 19	2 19	2 19	2 19	2 19	2 19	1 80	1 80
16	2 99	2 99	2 99	2 99	2 99	3 06	2 99	2 99	2 99	2 99	2 99	2 51	2 51
17	4 27	4 27	4 27	4 27	4 27	4 27	4 27	4 27	4 27	4 27	4 27	3 59	3 59
18	7 69	7 69	7 69	7 69	7 69	7 69	7 69	7 69	7 69	7 69	7 69	6 47	6 47
19	2 59	2 59	2 59	2 59	2 59	3 43	3 43	3 43	3 43	3 43	3 43	2 16	2 16
1 W.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Less refunds for over-levies	700 73	723 19	699 06	698 67	687 50	692 95	703 29	691 70	711 24	701 55	701 55	588 71	588 71
	.....	.....	19 76	.....	.....	7 47	.....	.....	.....	3 13	.....	.....	.....
Add Township proportion of levies	700 73	723 19	679 30	698 67	687 50	685 48	703 29	691 70	711 24	698 42	701 55	588 71	588 71
	175 18	180 80	169 83	174 67	171 88	171 37	175 82	172 93	177 81	174 61	175 39	147 18	147 18
	\$875 91	\$903 99	\$849 13	\$873 34	\$859 38	\$856 85	\$879 11	\$864 63	\$889 05	\$873 03	\$876 94	\$735 89	\$735 89

## TOWNSHIP OF EASTNOR.

ANNUAL LEVIES FOR THE YEARS 1906 TO 1912 FOR JUDGES CREEK DRAINAGE DEBENTURES  
By-law No. 756.JUDGES CREEK DRAINAGE SCHEME. LEVIES FOR  
MAINTENANCE FOR THE YEARS 1904 TO 1912.

Land	Con.	Lot	By-law 756 Amounts to be levied		Levy 1906		Levy 1907		Levy 1908		Levy 1909		Levy 1910		Levy 1911		Levy 1912		Main- tenance Levy By-law 664 1904		Main- tenance Levy By-law 822 1907		Main- tenance Levy By-law 875 1909		Main- tenance Levy By-law None 1911	
			\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.
1 W.....		2	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	47	29	1 47	29	29	23	23	
		3	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	71	43	2 20	43	43	35	35	
		4	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	47	29	1 47	29	29	23	23	
		8	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	1 19	71	3 66	71	71	58	58	
		9	1 11	1 11	1 11	1 11	1 11	1 11	1 11	1 11	1 11	1 11	1 11	1 11	1 11	1 11	1 11	1 11	2 14	1 30	6 59	1 30	1 30	1 04	1 04	
		10	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	1 19	58	3 66	58	58	92	92	
		11	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	1 90	1 16	5 85	1 16	1 16	1 15	1 15	
		12	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	2 38	1 44	7 32	1 44	1 44	1 15	1 15	
		13	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	71	35	2 20	35	35	46	46	
		14	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	95	57	2 93	57	57	23	23	
		15	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	48	29	1 47	29	29	23	23	
		16	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	48	29	1 47	29	29	23	23	
		17	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	2 38	1 44	7 32	1 44	1 44	1 15	1 15	
	1 E.....		18	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	4 75	2 89	14 64	2 89	2 89	2 30	2 30
			19	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	4 75	2 89	14 64	2 89	2 89	2 30	2 30
			20	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	1 90	1 16	5 85	1 16	1 16	92	92
			1	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	47	29	1 27	29	29	23	23
		2	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	4 75	2 89	14 64	2 89	2 89	2 30	2 30	
		3	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	4 75	2 89	14 64	2 89	2 89	2 30	2 30	
		4	2 10	2 10	2 10	2 10	2 10	2 10	2 10	2 10	2 10	2 10	2 10	2 10	2 10	2 10	2 10	2 10	4 04	2 46	12 44	2 46	2 46	1 96	1 96	
		5	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	1 90	2 89	5 85	2 89	2 89	92	92	
		6	1 85	1 85	1 85	1 85	1 85	1 85	1 85	1 85	1 85	1 85	1 85	1 85	1 85	1 85	1 85	1 85	3 56	1 73	10 98	1 73	1 73	1 73	1 73	
		7	2 35	2 35	2 35	2 35	2 35	2 35	2 35	2 35	2 35	2 35	2 35	2 35	2 35	2 35	2 35	2 35	4 51	2 19	13 90	2 17	2 17	2 19	2 19	
		8	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	4 75	2 89	14 64	2 89	2 89	2 30	2 30	
		9	2 22	2 22	2 22	2 22	2 22	2 22	2 22	2 22	2 22	2 22	2 22	2 22	2 22	2 22	2 22	2 22	4 28	2 61	13 17	2 61	2 61	2 07	2 07	
		10	2 22	2 22	2 22	2 22	2 22	2 22	2 22	2 22	2 22	2 22	2 22	2 22	2 22	2 22	2 22	2 22	4 28	2 89	14 64	2 89	2 89	2 30	2 30	
		11	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	4 75	2 89	14 64	2 89	2 89	2 30	2 30	
		12	1 98	1 98	1 98	1 98	1 98	1 98	1 98	1 98	1 98	1 98	1 98	1 98	1 98	1 98	1 98	1 98	3 80	2 32	11 71	2 32	2 32	1 84	1 84	
		13	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	1 66	94	5 12	94	94	81	81	
		14	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	2 38	1 44	7 32	1 44	1 44	1 15	1 15	
	15	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	2 38	1 44	7 32	1 44	1 44	1 15	1 15		
	16	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	1 24	2 38	1 44	7 32	1 44	1 44	1 15	1 15		
	17	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	2 48	4 75	2 89	14 64	2 89	2 89	2 30	2 30		

[illegible]

Forward.....





[illegible]

<sup>2</sup>See report

*To His Honour the Lieutenant-Governor-in-Council and to the Reeve and Council of the Township of Eastnor, in the County of Bruce.*

In the matter of Judge's Creek Drainage Scheme:

An appeal by the Municipal Council of the Township of Eastnor against the report of Special Auditor, dated March 6th, 1913, and my conclusions thereon are respectfully submitted, as follows:

The Council states:

(a) That \$65.00 paid Mr. Wm. Shaw for damages on account of a deviation made in the course of the drain by the Council should be charged against the Drainage Scheme.

I find that there is nothing to show that the Engineer had amended his report or authorized any variation in the course of the drain, there was therefore no authority for such variation, nor for charging the \$65.00 against the drain, even though such variation may, as alleged, have been beneficial.

(b) That the sum of \$42.30 credited to the drain account for interest upon moneys said to have been loaned to the municipality should not have been so credited.

After a careful consideration I agree with the contention of the Council on this point.

I find that in the years 1904 and 1905 the sum of \$735.52 was borrowed to pay the debenture instalment under By-law 551 and the interest, \$14.50, \$29.93 and \$33.50, charged against the drain account. At the date of such loan in 1904 the sum of \$273.33, and in 1905 the sum of \$408.02, stood to the credit of the debenture account and the whole amount of the interest on the loans should not have been charged to the drain: I therefore now credit the drain account with \$16.50 and \$18.50, proportionate parts of said interest.

(c) That \$50.59 short levies under By-law 756 should not be charged against drain.

I find that By-law 756 provides for a levy in each year of \$253.89, whereas \$260.72 is required to meet the annual instalments under the By-law, causing a deficit in each year of \$6.83 and in 7 years of \$47.81. This amount I charge against the drain. The balance of the \$50.59 being \$2.78, should not be met by those ratepayers who have paid their full rates.

(d) That the balances standing to the credit of the drain accounts as shown by said report are not correct.

I find the balances to credit of the debenture account under By-law 551 on the 31st December, 1912, to be \$504.53 for ratepayers' portion, and \$96.13 for municipality's portion, and to the credit of construction account on 31st December, 1907, \$450.61. Statements showing how such balances have been arrived at are submitted herewith.

23rd April, 1913.

J. W. SHARPE.  
Provincial Municipal Auditor.

#### THE JUDGES CREEK DRAINAGE SCHEME.

##### SUMMARY OF ALL ACCOUNTS.

Balance	Construction account .....	\$450 61
"	Debenture account .....	504 53
"	Debenture account .....	96 13

Balance Maintenance account .....		\$91 47
Short Levies' By-law, 756.....	\$47 81	
Balance.....	1,094 93	
	<u>\$1,142 74</u>	<u>\$1,142 74</u>

## THE JUDGES CREEK DRAIN.

## CONSTRUCTION ACCOUNT.

1907.			
Dec. 31.	Payments on account to date.....	\$15,415 38	
	Interest paid to date.....	567 23	
	Proceeds of debentures (princ.).....		\$10,000 00
	"                                    ".....		2,800 00
	" By-law (princ.) .....		600 00
	Government grant .....		2,480 00
	Interest received to date.....		553 22
	Balance.....	450 61	
		<u>\$16,433 22</u>	<u>\$16,433 22</u>
	Balance on 31st Dec., 1907.....		\$450 61

THE RATEPAYERS OF JUDGES CREEK DRAIN IN ACCOUNT WITH THE  
MUNICIPALITY OF EASTNOR.

1902.	Debenture Account.	Dr.	Cr.		Bal.
Mar. 25.	To paid Deb. No. 1.....	\$588 71		Dr.	\$588 71
1903.					
Jan. 1.	By rates on roll of 1902.....		\$723 19	Cr.	134 48
April 1.	To paid Deb. No. 2.....	588 71		Dr.	454 23
1904.					
Jan. 1.	By rates on roll of 1903.....		679 30	Cr.	225 07
April 1.	To paid Deb. No. 3.....	588 71		Dr.	363 64
1905.					
Jan. 1.	By rates on roll of 1904.....		698 67	Cr.	335 03
April 1.	To paid Deb. No. 4.....	588 71		Dr.	253 68
1906.					
Jan. 1.	By rates on roll of 1905.....		687 50	Cr.	433 82
April. 4.	To paid Deb. No. 5.....	588 71			
1907.					
Jan. 1.	By rates on roll of 1906.....		685 48	Cr.	530 59
April 1.	To paid Deb. No. 6.....	588 71		Dr.	58 12
1908.					
Jan. 1.	By rates on roll of 1907.....		703 29	Cr.	645 17
Mar. 17.	To paid Deb. No. 7.....	588 71		"	56 46
1909.					
Jan. 1.	By rates on roll of 1908.....		691 70	"	748 16
Mar. 31.	To paid Deb. No. 8.....	588 71		"	159 45
1910.					
Jan. 1.	By rates on roll of 1909.....		711 24	"	870 69
Mar. 30.	To paid Deb. No. 9.....	588 71		"	281 98
1911.					
Jan. 1.	By rates on roll of 1910.....		698 42	"	980 40
April 21.	To paid Deb. No. 10.....	588 71		"	391 69
1912.					
Jan. 1.	By rates on roll of 1911.....		701 55	"	1,093 24
April 1.	To paid Deb. No. 11.....	588 71		"	504 53
	Balance.....	504 53			
		<u>\$6,980 34</u>	<u>\$6,980 34</u>		

## TOWNSHIP PORTION OF DEBENTURE ACCOUNT.

	Eleven debentures paid, each \$147.17.....	\$1,618 87	
	Ten years' rates, 1902-11, each \$171.50.....		\$1,715 00
1912.			
Dec. 31.	Balance.....	96 13	
		<u>\$1,715 00</u>	<u>\$1,715 00</u>

## TOWNSHIP OF GLOUCESTER.

*To His Honour the Lieutenant-Governor in Council.*

SIR,—Under authority of an Order in Council dated approved by His Honour the Lieutenant-Governor of Ontario, in pursuance of Sub. sec. 3, Sec. 9, Cap. 228, R.S.O., 1897, I, George L. Blatch, Chartered Accountant of the City of Ottawa, was instructed by the Provincial Municipal Auditor to make an examination and audit of the books and accounts of the Township of Gloucester in the County of Carleton.

I have made a general examination of the books and accounts of the treasurer of the Township of Gloucester, Mr. H. B. Billings, during his term of office, covering a period of six years, from July 8th, 1907, to July 8th, 1913.

I have compared the totals of the Assessment on the Collector's Rolls with the Assessment Rolls, and proved the totals of the taxes on the Collector's Rolls. The revenue from taxes has been properly accounted for, and lists of uncollected taxes have each year been sent to the County Treasurer. The revenue from other sources as far as I have been able to ascertain has been correctly accounted for. The Receipts and Expenditure have been audited each year by the regular auditors to Dec. 31st, 1912, whose certificates I accept as correct. The balance of cash on hand on Dec. 31st, 1912 was \$21.57.

## ASSESSMENT ROLLS.

In the assessment rolls, which should be absolutely correct, as they are the foundation on which the Collector's Rolls are made up, there are several errors. In the year 1907, on page 12, there is an error of \$900, in which the total is too great. In the year 1910, page 4. \$100; page 26, \$100; page 28, \$10; page 46, \$100 should be added and page 38 \$600 should be deducted, net \$290 to be deducted. In the year 1912, the total Assessment as set down in the Roll is \$1,920,536, whereas the correct total is \$1,945,386, a difference of \$24,850, but the taxes levied for township, county and general school rates are figured on the latter amount.

## COLLECTORS' ROLLS.

Year 1907, No. 870, page 38, Chas. Butler, taxes \$53.24 should be \$43.24. Year 1907, No. 870, page 64. S. Hammon, error in Assessment, \$100. Year 1908, page 43, total of Separate School Column should be \$163.59, instead of \$143.59, and the total of taxes \$391.82, instead of \$371.82, a difference of \$20. This amount should be charged to the Collector, as the full amount was collected.

Year 1909, No. 643, page 33, Jos. Leblanc, \$5.48 should be \$6.17, difference of 69 cents, and school tax \$2.60 should be \$3.90 a difference of \$1.30. This amount \$1.99 is included in the total taxes but not extended opposite No. 643, consequently, it has been charged to the Collector and possibly not collected. Year 1910, No. 808, page 40. Lawrence Gravelle, \$9.53 should be \$7.53. This is an error of \$2.00 in the amount extended, but the total of taxes column is correct. If this amount was collected it should be refunded by the Collector.

Aside from the above clerical errors I find the books very well and neatly kept, the records of the township systematic and the funds properly accounted for.

The total amount of receipts during the six years from July 8th, 1907 to July 8th, 1913, was \$288,658.12, and the total amount of Expenditure \$287,608.62,



leaving a balance of \$1,049.50, which amount I find on deposit in the Bank of Ottawa.

My attention has been called to the fact that certain special meetings of the Council of the township were held on the 2nd day of May, 1912, to pass by-laws authorizing certain plans within the township. That the clerk collected certain fees from the applicants to cover the expenses of said meetings and disbursed these same fees by paying the councillors and the clerk for their services. These transactions do not appear on the books of the township. Legal action was taken by some of the parties to recover the fees so paid, and I am informed that judgment has been given ordering the clerk to refund the amount of fees so collected.

The treasurer has given private bonds, a copy of which he has shewn me, but as the township solicitor who holds the original is away from home I have been unable to see it but will examine it as soon as he returns.

The Collector's Roll for 1912 has not yet been returned.

I have the honor to be.

Sir,

Your obedient servant,

GEO. L. BLATCH,

Chartered Accountant.

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## TOWNSHIP OF GLOUCESTER.

RECEIPTS JULY 8TH TO DEC. 31ST, 1907.

1907.			
July 8.	Balance transferred from treasurer, Wm. Smith.....		\$343 68
Dec. 15.	Collector of taxes, 1906.....	\$4,340 79	
	“ “ 1907.....	2,302 00	
			6,642 79
	Arrears of taxes .....	\$26 00	
	Non-resident taxes .....	246 07	
			272 07
	Fines.....		10 75
	Licenses.....		395 00
	Loans, general .....	2,200 00	
	“ Heron Road .....	1,500 00	
			3,700 00
	Legislative grants .....		1,109 88
	Hall rent .....		10 00
	Miscellaneous.....		119 91
	Board of Health.....		206 00
	Heron Road, Local improvement.....		125 00
			\$12,935 08
Dec. 31.	Collector of taxes, 1906.....	530 71	
	B. Frappier, not on roll.....	\$3 00	
	Collector of taxes, 1907.....	3,090 00	
		3,093 00	
			3,623 71
	Licenses.....		5 00
	Legislative Grant .....		447 93
	Miscellaneous.....		42 00
	Debentures.....		1,500 00
			\$18,553 72

## TOWNSHIP OF GLOUCESTER.

RECEIPTS JAN. 1ST TO DEC. 31ST, 1908.

1908.			
	Collector of taxes, 1907.....	\$25,056 54	
	“ “ 1908.....	1,570 00	
			\$26,626 54
	Arrears of taxes .....	51 83	
	Non-resident taxes .....	296 63	
			348 46
	Fines.....		100 00
	Licenses.....		354 54
	Loans general .....		7,000 00
	Legislative grants .....	455 50	
		1,177 40	
			1,632 90
	Hall rent .....		2 00
	Miscellaneous.....		545 34
	Board of Health.....		146 50
	Debentures.....		800 00
			\$37,556 28
	Collector of taxes, 1907.....	1,450 00	
	“ “ 1908.....	2,703 60	
			4,153 60
			41,709 88
	Balance Jan. 1, 1908.....		166 46
			\$41,876 34

## TOWNSHIP OF GLOUCESTER.

## RECEIPTS JAN. 1ST TO DEC. 31ST, 1909.

1909.				
Dec. 15.	Collector of taxes, 1907.....	\$ 367 93		
	“ “ 1908.....	28,055 01		
	“ “ 1909.....	2,216 00		
				\$30,638 94
	Arrears of taxes.....	29 77		
	Non-resident taxes .....	271 28		
				301 05
	Fines.....			8 50
	Licenses.....			255 00
	Loans general .....			10,400 00
	Legislative grants .....			1,080 62
	Hall rent .....			10 00
	Miscellaneous.....			885 11
	Board of Health.....			113 00
	Debentures.....			5,146 91
	Village of Eastview.....			52 12
				\$48,891 25
Dec. 31.	Collector of taxes, 1908.....	1,070 00		
	“ “ 1909.....	1,707 00		
				2,777 00
	Legislative grants .....			427 59
				\$52,095 84
	Balance January 1, 1909.....			155 75
				\$52,251 59

## TOWNSHIP OF GLOUCESTER.

## RECEIPTS JAN. 1ST TO DEC. 31ST, 1910.

1910.				
Dec. 15.	Collector of taxes, 1908.....	\$ 750 00		
	“ “ 1909.....	26,192 41		
	“ “ 1910.....	1,745 36		
				\$28,687 77
	Arrears.....	199 44		
	Non-resident taxes .....	753 04		
				952 48
	Fines.....			.....
	Licenses .....			388 67
	Loans, general .....			8,000 00
	“ Rockcliffe .....			5,000 00
	Legislative grants .....			1,893 31
	Miscellaneous.....			521 27
	Debentures.....			165 98
				\$45,609 48
	Miscellaneous . . . . .			22 00
Dec. 31.	Collector of taxes, 1909.....	400 00		
	“ “ 1910.....	2,487 63		
				2,887 63
	Legislative grants .....			222 00
				\$48,741 11
	Balance Jan. 1, 1910.....			166 46
				\$48,907 57

## TOWNSHIP OF GLOUCESTER.

## RECEIPTS JAN. 1ST TO DEC. 31ST, 1911.

1911.					
Dec. 15.	Collector of taxes, 1909.....	\$ 1,827 80			
	“ “ 1910.....	25,638 39			
	“ “ 1911.....	495 01			
					\$27,961 20
	Arrears of taxes .....	195 70			
	Non-resident taxes .....	1,775 93			
					1,971 63
	Licenses.....				305 50
	Loans, general .....				4,000 00
	Legislative grants .....				1,612 83
	Miscellaneous.....				275 12
					\$36,126 28
Dec. 31.	Collector of taxes, 1911.....				4,989 96
	Legislative grants .....				424 04
					\$41,540 28
	Balance January 1st, 1911.....				137 23
					\$41,677 51

## TOWNSHIP OF GLOUCESTER.

## RECEIPTS JAN. 1ST TO DEC. 31ST, 1912.

Dec. 15.	Collector of taxes, 1910 .....	\$2,741 21			
	“ “ 1911.....	31,032 73			
	“ “ 1912.....	695 84			
					\$34,469 78
	Arrears of taxes .....	8 69			
	Non-resident taxes .....	1,814 29			
					1,822 98
	Fines.....				2 00
	Licenses .....				269 38
	Loans, general .....				4,000 00
	Legislative grants .....				2,395 01
	Miscellaneous.....				964 53
	Board of Health .....				140 50
	Debentures.....				4,456 00
					\$48,520 18
Dec. 31.	Collector of taxes, 1912.....				881 50
					\$48,401 68
	Balance Jan. 1st, 1912.....				127 51
					\$49,529 19

## TOWNSHIP OF GLOUCESTER.

## CASH STATEMENT JAN. 1ST TO JULY 8TH, 1913.

## RECEIPTS.

Balance on hand, January 1st.....	\$21 57	
Resident taxes, 1911 .....	\$1,264 52	
W. A. Ramsay taxes, 1912.....	3,328 08	
Bank of Ottawa taxes, 1912.....	31,516 99	
	\$36,109 59	
J. Woodruff, not on roll 1912.....	3 11	
		36,112 70
Arrears of taxes .....		37 56
Fines.....		25 00
Licenses .....		172 00
Miscellaneous.....		268 35
		\$36,637 18



## EXPENDITURE.

Hemlock Road Local Improvement.....	\$1,976 71	
Rockcliffe P. V. ....	1,300 00	
Elections.....	134 00	
Salaries and allowances.....	1,286 00	
Stationery and printing.....	240 64	
Roads and bridges.....	2,023 86	
Charity.....	138 12	
County rates .....	6,497 94	
School purposes .....	16,426 84	
Board of Health.....	442 26	
Debentures .....	1,161 81	
Interest.....	347 00	
Miscellaneous.....	613 31	
Drainage.....	150 00	
Sheep killed and rebates.....	15 00	
Statute Labour Div. No. 1.....	632 05	
"      "      "      2.....	462 09	
"      "      "      3.....	620 75	
"      "      "      4.....	661 14	
"      "      "      5.....	458 16	
		35,587 68
Balance.....		\$1,049 50
Subject to regular audit.		

## TOWNSHIP OF GLOUCESTER.

EXPENDITURE JULY 8TH TO DEC. 31ST, 1907.

Dec. 15. Salaries and allowances.....	\$1,348 20	
Printing and stationery.....	103 00	
Roads and bridges.....	286 84	
County rates .....	631 89	
School purposes .....	2,018 59	
Interest.....	184 33	
Board of Health.....	255 82	
Debentures .....	747 85	
Coupons.....	34 96	
Heron Road .....	1,676 85	
Drainage.....	419 65	
Miscellaneous .....	93 04	
Statute Labour .....	3,857 60	
		\$11,658 62
Dec. 31. Salaries and allowances.....	380 45	
Law costs .....	90 00	
Roads and bridges .....	1 50	
Charity .....	10 00	
School purposes .....	2,339 37	
Interest.....	13 35	
Loans.....	3,700 00	
Drainage.....	24 60	
Miscellaneous.....	83 07	
Statute Labour .....	86 30	
		6,728 64
		\$18,387 26
Balance.....		166 46
		\$18,553 72

## TOWNSHIP OF GLOUCESTER.

EXPENDITURE DEC. 31ST, 1908.

Dec. 15.	Salaries and allowances.....	\$2,073 05	
	Elections.....	106 00	
	Printing and stationery.....	321 50	
	Roads and bridges.....	1,535 25	
	Charity.....	144 08	
	County rates .....	4,660 83	
	School purposes .....	12,657 44	
	Interest.....	207 12	
	Board of Health.....	197 65	
	Debentures.....	2,575 66	
	Coupons.....	281 57	
	Loans.....	5,000 00	
	Drainage.....	343 37	
	Miscellaneous.....	268 36	
	Rockliffe Park, Police Village.....	100 00	
	Statute Labour .....	5,494 64	
			\$35,966 52
Dec. 31.	Salaries and allowances.....	128 25	
	Roads and bridges.....	3 00	
	County rates .....	1,133 77	
	School purposes .....	4,232 59	
	Drainage .....	46 80	
	Miscellaneous.....	20 16	
	Rockliffe Park, Police Village.....	135 50	
	Statute Labour .....	39 00	
	Manotick Police Village.....	15 00	
			5,754 07
			\$41,720 59
	Balance.....		155 75
			\$41,876 34

## TOWNSHIP OF GLOUCESTER.

EXPENDITURE, JANUARY 1ST, TO DECEMBER 31ST, 1909.

Dec. 15.	Salaries and allowances .....	\$2,314 00	
	Printing and stationery .....	329 51	
	Law costs .....	200 00	
	Roads and bridges .....	749 52	
	Charity .....	122 15	
	County rates .....	3,800 00	
	School purposes .....	14,880 06	
	Interest .....	261 07	
	Board of Health .....	192 90	
	Debentures .....	1,677 98	
	Coupons .....	488 66	
	Loans .....	9,400 00	
	Drainage .....	3,402 45	
	Miscellaneous .....	322 47	
	Rockliffe Park, Police Village .....	207 40	
	Statute labour .....	6,018 51	
	Buena Vista sidewalk .....	2,446 91	
	Eastview Village .....	615 95	
			47,429 54
Dec. 31.	County rates .....	1,600 00	
	School purposes .....	3,055 59	
			4,655 59
			\$52,085 13
	Balance .....		166 46
			\$52,251 59

## TOWNSHIP OF GLOUCESTER.

EXPENDITURE, JANUARY 1ST TO DECEMBER 31ST, 1910.

Dec. 15.	Elections .....	\$98 00	
	Salaries and allowances .....	2,094 40	
	Printing and stationery .....	298 55	
	Roads and bridges .....	1,316 34	
	Charity .....	102 94	
	County rates .....	3,199 38	
	School purposes .....	13,698 69	
	Interest .....	278 45	
	Board of Health .....	316 23	
	Debentures .....	2,030 85	
	Coupons .....	640 78	
	Loans .....	8,000 00	
	Drainage .....	90 00	
	Miscellaneous .....	669 23	
	Rockcliffe Park, Police Village .....	500 00	
	Statute labour .....	3,419 45	
	Rockcliffe Park, water system .....	4,402 91	
	Osgoode, Township .....	30 06	
			\$41,186 20
Dec. 31.	Salaries and allowances .....	70 00	
	Printing and stationery .....	75	
	County rates .....	4,299 38	
	School purposes .....	3,214 01	
			7,584 14
			\$48,770 34
	Balance .....		137 23
			\$48,907 57

## TOWNSHIP OF GLOUCESTER.

EXPENDITURE, JANUARY 1ST TO DECEMBER 31ST, 1911.

Dec. 15.	Elections .....	\$124 00	
	Salaries and allowances .....	1,984 20	
	Printing and stationery .....	295 36	
	Law costs .....	526 94	
	Roads and bridges .....	682 66	
	Charity .....	237 19	
	County rates .....	500 00	
	School purposes .....	13,575 70	
	Interest .....	150 41	
	Board of Health .....	758 87	
	Debentures .....	1,577 25	
	Coupons .....	469 81	
	Loans .....	8,000 00	
	Drainage .....	59 22	
	Miscellaneous .....	336 24	
	Rockcliffe Park, P. V. ....	1,000 00	
	Statute labour .....	4,027 38	
	Rockcliffe Park, water system .....	625 50	
	Refund, Finley Creek .....	576 39	
			35,507 12
Dec. 31.	Salaries and allowances .....	70 00	
	County rates .....	3,589 59	
	School purposes .....	2,383 29	
			6,042 88
			\$41,550 00
	Balance .....		127 51
			\$41,677 51

## TOWNSHIP OF GLOUCESTER.

EXPENDITURE, JANUARY 1ST TO DECEMBER 31ST, 1912.

Dec. 15.	Elections . . . . .	\$98 00	
	Salaries and allowances . . . . .	2,363 67	
	Printing and stationery . . . . .	424 88	
	Law costs . . . . .	151 88	
	Roads and bridges . . . . .	1,461 24	
	Charity . . . . .	84 83	
	County rates . . . . .	2,000 00	
	School purposes . . . . .	17,064 10	
	Interest . . . . .	124 65	
	Board of Health . . . . .	500 57	
	Debentures . . . . .	1,315 94	
	Coupons . . . . .	375 80	
	Loans . . . . .	13,000 00	
	Drainage . . . . .	186 94	
	Miscellaneous . . . . .	695 57	
	Rockliffe Park, Police Village . . . . .	1,046 75	
	Statute labour . . . . .	4,941 72	
	Refund, Finley Creek . . . . .	126 17	
	Base line round L. F. sidewalk . . . . .	912 07	
	Hemlock Road L. F. sidewalk . . . . .	1,661 90	
	Sheep killed . . . . .	32 00	
			\$48,568 68
Dec. 31.	Salaries and allowances . . . . .	70 00	
	School purposes . . . . .	868 75	
	Miscellaneous . . . . .	19	
			938 94
			\$49,507 62
	Balance . . . . .		21 57
			\$49,529 19

## STATEMENT OF COLLECTORS' ROLLS, TOWNSHIP OF GLOUCESTER.

## COLLECTOR OF TAXES, 1907.

To amount on roll . . . . .	\$33,833 00	
" interest charged February, 1908 . . . . .	410 88	
" " May, 1908 . . . . .	259 85	
By cash to December 15th, 1907 . . . . .		\$2,302 00
" " December 31st, 1907 . . . . .		3,090 00
" " December 15th, 1908 . . . . .		25,056 54
" " December 31st, 1908 . . . . .		1,450 00
" " January, 1909 . . . . .		200 00
" " February, 1909 . . . . .		167 93
		\$32,266 47
" Errors and corrections . . . . .		417 43
" County Treasurer . . . . .		15 30
" Return to County Treasurer . . . . .		1,782 86
		\$34,482 06
" Balance due by collector . . . . .		21 67
	\$34,503 73	\$34,503 73

## COLLECTOR OF TAXES, 1908, N. J. TREMBLAY.

To amount on roll . . . . .	\$35,558 59	
Interest charged February 1st, 1909 . . . . .	462 23	
" " May 1st, 1909 . . . . .	279 85	
To error in total, Separate School, p. 43 . . . . .	20 00	
By cash to December 15th, 1908 . . . . .		\$1,570 00
" " December 31st, 1908 . . . . .		2,703 60
" " December 15th, 1909 . . . . .		28,055 01
" " December 31st, 1909 . . . . .		1,070 00
" " February 1st, 1910 . . . . .		750 00
		\$34,148 61



By Errors and remissions .....	\$257 00	
" Returned to Treasurer uncollected .....	2,046 07	
To balance due collector .....	131 01	
		<hr/>
	\$36,451 68	\$36,451 68

N. J. Tremblay was paid \$151.00 on March 7th, 1910, by order of Council.

### STATEMENT OF COLLECTORS' ROLLS, TOWNSHIP OF GLOUCESTER.

#### COLLECTOR OF TAXES, 1909.

Amount on roll .....	\$33,665 92	
Interest charged February 1st, 1910 .....	400 00	
" " May 1st, 1910 .....	287 81	
By cash to December 15th, 1909 .....		\$2,216 00
" " December 31st, 1909 .....		1,707 00
" " December 15th, 1910 .....		25,620 66
" " December 31st, 1910 .....		400 00
" " January 31st, 1911 .....		1,100 00
" " February 28th, 1911 .....		300 00
" " March 4th, 1911 .....		427 80
" " April 4th, 1911 .....		571 75
		<hr/>
" Errors and remissions .....	\$32,343 21	
" Returned to Treasurer uncollected .....	211 87	
	1,798 65	
	<hr/>	
	\$34,353 73	\$34,353 73

#### COLLECTOR OF TAXES, 1910, N. J. TREMBLAY.

Amount on roll .....	\$34,431 69	
Interest charged February 9th, 1911 .....	425 00	
" " May 1st, 1911 .....	300 00	
By cash to December 15th, 1910 .....		\$1,745 36
" " December 31st, 1910 .....		2,487 63
" " December 31st, 1911 .....		25,638 39
" " December 31st, 1912 .....		2,741 21
		<hr/>
" Finley Creek, taxes cancelled .....	\$32,612 59	
To Finley Creek, taxes collected .....	886 04	
" Charges by order of Council .....	576 39	
" " .....	22 82	
By returned to Treasurer uncollected .....		1,716 34
" Errors and remissions .....		540 93
	<hr/>	
	\$35,755 90	\$35,755 90

#### COLLECTOR OF TAXES, 1911, J. INNES.

To amount on Roll .....	\$38,605 54	
" Taxes, 1910, deposited in bank .....	113 28	
" Interest, February 1st, 1912 .....	441 37	
" " May 1st, 1912 .....	282 47	
" Omissions .....	20 92	
" Interest on omissions .....	2 10	
" W. J. Henderson, taxes paid twice .....	7 40	
" H. Demarches, " " " .....	4 53	
" T. Clarey, " " " .....	15 59	
		<hr/>
		39,493 20
By cash to December 13th, 1911 .....	\$495 01	
" " to December 28th .....	4,989 96	
" " 1912 .....	31,032 74	
" " to January 13th, 1913 .....	432 61	
" " to February 3rd, 1913 .....	536 09	
" " to April 23rd, 1913 .....	295 82	
" Errors and remissions .....	201 56	
" Interest on errors .....	20 16	
" Uncollected .....	1,489 07	
	<hr/>	
		39,493 02
Balance .....		<hr/>
		\$0 18

## TOWNSHIP OF TINY.

*To His Honour, the Lieutenant-Governor in Council, and to the Reeve and Councillors of the Municipality of the Township of Tiny.*

YOUR HONOUR AND GENTLEMEN :

Under authority of an Order in Council, dated the 25th day of September, 1913, I have made an inspection and examination of the books and records of the Township of Tiny for the period from January 1st, 1910, to September 30th, 1913. Attached hereto are the following schedules:—

- (a) Statement of Assets and Liabilities at 31st December, 1912.
- (b) Statement of Receipts and Expenditures for the period from January 1st, 1910, to September 30th, 1913.
- (c) Statement of Arrears, affecting Drainage Debentures, placed in Solicitor's hands for collection.
- (d) Statement showing amount levied and realized, exclusive of interest, for Drainage Debentures.

## CASH RECEIPTS AND DISBURSEMENTS.

A Comparative Statement of Cash Receipts and Disbursements for the period under examination is attached.

The balance, as shown by the Cash Book at September 30th, 1913, has been duly verified, and a statement obtained from the bank showing the outstanding Bills Payable.

The Overdraft on Current Account at December 31st, 1912, amounting to \$3,021.18, included cheques issued but not presented for payment until after the 1st of January, 1913, aggregating \$1,772.20.

Arrangements have been made with the bank carrying the account of the Township to receive payment of the taxes, thus avoiding inadvertent and unnecessary overdrafts on the Township account.

No particulars have been furnished by the County Treasurer, with his remittances, of the lands covered by the Non-Resident Taxes paid to him, nor have any details been given of the receipts from property sold for taxes.

By-laws were duly passed to support loans obtained from the bank, with the exception of the \$5,000 in 1913, which appears to be a renewal of a loan for a similar amount obtained in 1912.

Disbursements for current expenses are covered by Minutes of the Council directing the issue of orders by the Reeve.

Disbursements are made by cheque signed by the Treasurer and countersigned by the Reeve.

On June 3rd, 1913, a by-law was submitted to the ratepayers to provide for the issue of debentures to the amount of \$12,000 to pay for the constructing of certain bridges on highways of the township.

The bridges referred to were the two already constructed in 1912,	
known as Gregg's Bridge and Dam, costing .....	\$6,712.02
McConnell's Bridge, costing .....	3,658.77

Total cost of bridges already constructed .....	\$10,370.79
and bridges proposed to be constructed, namely, on road	

between Concessions I and II, opposite Lot 91, at an estimated cost of .....	\$2,800.00	
and on road between Concessions II and III, opposite Lot 13, at an estimated cost of .....	4,200.00	
		\$7,000.00

The proposed by-law recited the construction of the two former bridges and that there is a balance owing of \$5,000 on account thereof.

The by-law was defeated and the estimated liability on account of the bridges already constructed is still outstanding.

#### TINY MARSH DRAINAGE.

A petition, claiming to be signed by the majority of the ratepayers affected by the condition of this marsh, was presented to the Council, requesting them to take steps to have the marsh drained. In pursuance of the request the Council passed, in 1894, by-law 292, authorizing the borrowing of \$3,698 and the issuing of Debentures therefor, payable in 20 years, and attached to the by-law was a schedule showing the estimated value of the improvement to the property locally affected and providing for an annual assessment to repay the amount borrowed. Some of the owners made default in their payments and the Council instructed the solicitors for the township to take action to collect the arrears. In 1907 the County Treasurer returned arrears against the property shown in the annexed schedule, and to these arrears were added the levy of 1907 still unpaid.

Settlements were finally made with the owners by the Township Solicitors as shown in the schedule, and the costs of the Solicitors were fixed and settled at \$218.00.

It will be noted that a compromise was accepted from the owner of Lots 18, 19 and 20, Con. 2.

No settlement was made with the owners of Lot 17, Con. 2, and in 1912 this property was sold by the County Treasurer for arrears, interest and costs, aggregating \$678.25, realizing at such sale \$225.00; a deficiency of \$453.25.

In 1909 the County Treasurer returned to the Township arrears against the north half of Lot 21, Con. 2, of \$135.59, to which was added the taxes for 1909 of \$27.72, making a total in arrear returned to the County Treasurer for 1909 of \$163.31. Adding to this the 10 per cent. added by the County Treasurer, \$16.33, and the unpaid taxes for 1910, \$27.60, shows a total in arrear against this property in \$1910 of \$207.24.

The owner appeared before the Council early in 1911 and stated he had been improperly assessed for 7 years, inasmuch only a portion of the property belonged to him. The Council granted him a rebate of \$90.00 and accepted a cash payment of \$117.24 in settlement of the arrears.

The records available in connection with the annual levy to meet these Debentures are very faulty, particularly as to the return of unpaid taxes to the County Treasurer and details of the collections made through him.

The Township has paid nineteen of the Debentures and all coupons up to and including those due in 1913, leaving one more payment still to be made. Any deficit which may have arisen between the annual levy and the amount realized from the property owners must, of necessity, have been paid out of the General Fund.

A statement is attached showing the total amount levied and cash realized exclusive of interest added by the County Treasurer.



## ANNUAL TAX LEVIES.

Attention is called to the method in which the annual tax levy is arrived at, particularly in relation to money to be raised for township purposes. No formal estimates are prepared, in an endeavor to arrive at the probable requirements for the year.

The following summary shows the actual amounts authorized to be levied for 1910, 1911 and 1912 for township purposes, including the payment of Debentures, and the actual disbursements during those years:

	Authorized Levy.	Actual Disbursements.
1910 . . . . .	\$6,450 50	\$7,277 89
1911 . . . . .	6,405 50	6,498 91
1912 . . . . .	7,950 50	14,753 79

The large difference between the disbursements of 1912 and the amount levied is occasioned principally by expenditures made on contracts for the construction of two bridges which were not provided for in the estimated requirements. These bridges are known as Bregg's Bridge and Dam: Lot 12, Con. IV, and McConnell's Bridge, over Copeland's Creek between Concessions 13 and 14.

Alternative estimates were obtained for the construction of a bridge or combined bridge and dam, at Lot 12, Con. IV, as follows:

For Bridge alone, including fill on approach . . . . .	\$4,430 00
For Bridge and Dam, including fill on approach . . . . .	4,980 00

The tender of J. J. Dumond, under the latter plan, for a lump sum of \$3,200 was accepted, to include excavations, concrete abutments and superstructure, laying gravel surface on approaches, name plate and payment of inspector's wages all according to plans and specifications, but not to include grading and filling approaches, maintaining traffic, fences on approaches, piling, cement or dry wall on approaches.

In addition to the lump sum named the following was to be allowed the contractor:

Piling—15 to 20 feet long . . . . .	40c. per lin. ft.
20 to 25 " " . . . . .	45c. " "
25 to 30 " " . . . . .	50c. " "
Over 30 " " . . . . .	55c. " "
Wooden Fence . . . . .	25c. " "
Concrete Post and Gas Pipe Railing . . . . .	45c. " "
Dry Wall . . . . .	\$1.50 per cub. yd.
Extra Excavations:—	
Above Water . . . . .	50c. per cub. yd.
Below Water . . . . .	\$1.50 " "
Concrete . . . . .	\$6.00 " "
Cement . . . . .	\$2.00 per bbl. of 350 lbs.

The Engineer's final certificate to the contractor indicates a total cost of \$6,201.71 made up as follows:

Lump sum price under contract . . . . .	\$3,200 00
Dry Wall . . . . .	\$594 05
Piling, 2,165 lin. ft. . . . .	1,004 20
Cement, 480 bbls. at \$2.00 . . . . .	960 00
Sheet Piling and Materials and Fittings for Pile Driver . . . . .	127 46
Extra Excavation, 30 yds. at \$1.50 . . . . .	45 00



Extra Steel, 3,850 lbs. at 3c. ....	\$115 50	
Extra Concrete, 23 yds. at \$5.00 .....	115 00	
Extras on Culvert .....	40 50	
		<u>3,001 71</u>
		\$6,201 71

Of this amount there has been paid by the Township up to Sept. 30th, 1913, as follows:

During 1912 .....	\$4,477 60	
" 1913 .....	1,624 11	
		<u>6,101 71</u>

and in addition the following expenditures have been made:

Engineer's Fees .....	358 06	
Other Labor and Materials .....	152 25	
		<u>510 31</u>

Making the total disbursements to Sept. 30th, 1913, on account Gregg's Bridge and Dam ..... \$6,612 02

In connection with this contract it will be noted that the construction of a dam was included. This was in pursuance of an agreement made with owner of the mill contiguous to the dam under which the owner agreed to do the grading and filling of the approaches to the bridge, and provide for the upkeep of same and also make a reduction in the price of cutting feed if the Council would include the construction of the dam in their bridge contract. The engineer for the township states the miller has performed his share of the agreement so far as the grading and filling of approaches are concerned.

The contract for the construction of McConnell's Bridge over Copeland's Creek between Concessions 13 and 14, was awarded to A. A. McDougall for the lump sum of \$1,900 exclusive of Dry Wall, etc.

The engineer's final certificate shows a total cost under the contract of \$3,240.45 made up as follows:

Contract Price .....	\$1,900 00	
Dry Wall, 224 yds. at \$1.25 .....	\$280 00	
Cement, 298 bbls. at \$2.00 .....	596 00	
Extra Concrete, 23 yds. at \$5.00 .....	115 00	
Extra Excavation (Wet) .....	20 00	
Extra Fill, 760 yds. at 40c. ....	304 00	
Extra Steel, 800 lbs. at 3c. ....	24 00	
Extra Time and Sheet Iron on Wings.....	1 45	
		<u>1,340 45</u>
Total paid Contractor .....	\$3,240 45	
Engineer's Fees and Expenses .....	231 52	
Other Labor and Material .....	186 80	
		<u>\$3,658 77</u>

Suggestions have been made with a view to improve the present methods of account keeping, which will doubtless be adopted by your Treasurer and be found to the advantage of the township.

Your very truly,

C. G. POWELL,  
Accountant.

TORONTO, Nov. 26, 1913.

## THE MUNICIPALITY OF THE TOWNSHIP OF TINY.

*Statement of Assets and Liabilities, 31st December, 1912.*

## LIABILITIES.

Debentures:—		
Railroad . . . . .	\$35,275 43	
Tiny Marsh Drainage . . . . .	512 00	
		\$35,787 43
Bills Payable . . . . .		12,500 00
Bank Overdraft on Current Account . . . . .		3,021 18
Dog Tax Fund . . . . .		97 89
		<u>\$51,406 50</u>

## ASSETS.

Taxes, Balance Collector's Roll, 1912:—		
Outstanding . . . . .	\$14,672 82	
Balance Dog Tax, 1911 . . . . .	7 00	
County Treasurer—Arrears of Taxes . . . . .	1,288 40	
		\$15,968 22
Town of Penetang, proportion of principal unpaid on Railroad Debentures (approximate) . . . . .		4,168 42
Cash on hand . . . . .		42 34
		<u>\$20,178 98</u>
Excess of Liabilities over Assets . . . . .		31,227 52
		<u>\$51,406 50</u>

## THE MUNICIPALITY OF THE TOWNSHIP OF TINY.

STATEMENT OF RECEIPTS AND EXPENDITURES FROM JANUARY 1ST, 1910, TO

SEPTEMBER 30TH, 1913.

Receipts	1910	1911	1912	Jan. 1st to Sept. 30, 1913
Balance at beginning of year:	\$	\$	\$	\$
In Bank .....	813 97	341 68	1,199 98	.....
Cash on Hand .....	50 16	47 55	16 75	42 34
Taxes: Collector, account 1909.....	8,666 14	.....	.....	.....
“ “ 1910.....	9,829 87	9,231 48	.....	.....
“ “ 1911.....	.....	11,768 79	8,475 84	.....
“ “ 1912.....	.....	.....	7,900 00	13,960 31
Dog Tax “ 1911.....	.....	320 00	141 00	.....
“ “ 1912.....	.....	.....	100 00	330 00
Defaulters “ 1909.....	58 23	.....	.....	.....
“ “ 1911.....	.....	.....	63 02	.....
Non-resident, County Treasurer....	156 96	108 82	133 28	44 03
Arrears of Taxes:	.....	.....	.....	3 22
Township Solicitor, on account settlement	.....	.....	.....	.....
Tiny Marsh Drainage Litigation.....	436 87	.....	.....	.....
Settlement <i>re</i> part Lot 21, Con. 2.....	.....	117 24	.....	.....
County Treasurer, Proceeds Tax Sales....	.....	137 04	.....	300 34
Loans from Bank:	.....	.....	.....	.....
Bills Payable .....	1,500 00	1,000 00	2,500 00	5,000 00
“ .....	3,000 00	2,500 00	1,000 00	2,500 00
“ .....	300 00	1,000 00	4,000 00	3,500 00
“ .....	600 00	.....	5,000 00	1,000 00
Overdraft on Current Account .....	.....	.....	3,021 18	.....
Schools:	.....	.....	.....	.....
Government Grant .....	676 00	930 50	778 50	567 36
County, for Accommodation and Equipt... R. R. Debenture—Annual proportion from Town of Penetang .....	275 93	255 75	264 00	.....
Licenses .....	291 95	291 95	291 95	291 95
Railway Taxation .....	48 00	50 00	.....	.....
Refunds:	83 24	66 24	37 68	.....
Overpayments <i>re</i> Roads and Bridges.....	10 50	40	.....	.....
Overpayment Wire Fence Bonus.....	19 35	.....	.....	.....
Indigent Funeral Expenses .....	12 80	.....	.....	.....
Statute Labour .....	.....	3 75	13 75	2 25
Sale—Lot 13, Con. 3 .....	.....	35 00	.....	.....
Sale—Lot 24, Con. 4 .....	.....	.....	35 00	.....
Miscellaneous .....	1 50	2 00	.....	.....
	26,831 47	28,208 19	34,971 93	27,541 80
Expenditures.				
Salaries, etc. ....	1,044 85	1,010 15	1,032 35	609 00
Stationery and Printing .....	109 13	97 95	136 77	138 94
Roads and Bridges .....	2,077 87	1,462 16	9,523 38	2,900 30
Charity .....	290 15	176 30	132 65	76 00
Wire Fence Bonus .....	806 82	400 47	570 70	253 80
Board of Health .....	32 40	155 60	25 40	.....
Statute Labour Refunds .....	29 00	28 70	3 00	2 00
Tax Refunds .....	2 60	9 84	43 48	12 41
Vital Statistics .....	33 40	31 80	30 60	28 40
Correcting and Revising Voters' Lists....	8 40	53 38	60 08	.....
Selecting Jurors .....	12 00	14 00	12 00	.....
Implements and Machinery .....	.....	205 00	90 00	.....
Survey .....	.....	52 70	64 10	.....
Election Expenses .....	.....	.....	75 00	79 00
“ “ By-law .....	.....	.....	.....	83 00
Purchase Sideroad between Lots 90 and 91, Con. 1 .....	.....	.....	130 00	.....
Land purchased at Tax Sale .....	.....	32 57	.....	.....

Expenditures	1910	1911	1912	Jan. 1st to Sept. 30, 1913
Legal Expenses <i>re</i> Collection of Arrears—	\$	\$	\$	\$
Tiny Marsh Drainage .....	218 00			
Dog Tax Fund—Refunds .....		27 00	4 00	
Sheep Killed by Dogs.....			432 11	205 89
Miscellaneous .....	87 35	86 05	174 80	150 93
Interest on Bills Payable and Overdraft...	144 55	232 15	199 40	513 85
Bills Payable:				
Standard Bank .....	1,500 00	1,500 00	1,000 00	2,500 00
" .....	500 00	3,000 00	2,500 00	1,000 00
" .....	200 00	300 00	1,000 00	4,000 00
" .....	3,000 00	600 00		5,000 00
Canada Road Mach. Company .....	250 00			
Overdraft on Current Account, Standard Bank .....				3,021 18
Debentures and Coupons:				
School Section No. 14 .....	391 00	374 00	357 00	
Drainage, Tiny Marsh .....	271 40	271 41	271 40	271 40
Railroad Loan .....	2,470 63	2,470 63	2,470 63	2,470 63
	13,479 55	12,591 86	20,338 85	23,316 72
County Rates .....	4,448 85	4,546 46	4,219 44	
Schools—Public .....	6,564 06	6,785 47	7,145 41	3,400 00
Separate .....	997 85	1,881 42	2,206 99	
Government Grant .....	676 00	930 50	778 50	
Accommodation and Equipment...	275 93	255 75	240 40	
Balance forward .....	389 23	1,216 73	42 34	825 08
	26,831 47	28,208 19	34,971 93	27,541 80

### THE MUNICIPALITY OF THE TOWNSHIP OF TINY.

#### STATEMENT OF ARREARS AFFECTING TINY MARSH DRAINAGE, PLACED IN SOLICITOR'S HANDS FOR COLLECTION AND RETURNS MADE.

Property	Con.	Arrears, 1907	1907 Levy un- paid	Amount in Solicitors hands for col- lection	Cash settle- ment received through Soli- citors
Lot 17, N. ½ less S. 29½ acres of N.E. ¼...	1	\$63 15	\$17 35	\$80 50	
" 18, N. 30 acs. of S. ½ and S.W. 40 acs. . .	1	157 46	16 80	174 26	
				\$254 76	251 31
" 19 .....	1	94 25	13 32	107 57	
" 20 .....	1	249 96	26 31	276 27	
				383 84	391 50
" 18 .....	2	144 37	19 70	164 07	
" 19 .....	2	161 24	23 17	184 41	
" 20 .....	2	174 95	26 19	201 14	
				549 62	236 56
		1,045 38	142 84	1,188 22	879 37



THE MUNICIPALITY OF THE TOWNSHIP OF TINY.

STATEMENT OF AMOUNT LEVIED FROM PROPERTY OWNERS FOR DRAINAGE DEBENTURES TO  
31ST DECEMBER, 1912.

To total amount levied from property owners from 1894 to 1912, inclusive, 19 years .....	\$4,911 94	
By collections made (exclusive of interest on arrears).....		\$4,120 20
By amount of assessments in default, exclusive of interest.....		475 82
By allowances made through Township Solicitors on compromise settlements . . . . .		315 92
	<u>\$4,911 94</u>	<u>\$4,911 94</u>

THE MUNICIPALITY OF THE TOWNSHIP OF TINY.

STATEMENT OF AMOUNT LEVIED FROM PROPERTY OWNERS FOR PAYMENT OF DRAINAGE DEBENTURES FROM 1894 TO 1912, INCLUSIVE.

	Levied against owners	Un- assessed	Over- assessed	Collected
Lot 16, Con. 1, E. 125 acres .....	43 13			43 13
" 16, " 1, W. 75 .....	95 00			95 00
" 17, " 1, N. 1/2 .....	315 15	16 65		315 15
" 17, " 1, E. 78 .....	73 79	1 00		73 79
" 17, " 1, S. W. 1/4 .....	2 85			2 85
" 18, " 1, E. 30 .....	8 74			8 74
" 18, " 1, W. 40 .....	51 00	6 00		51 00
" 18, " 1, Centre .....	319 20			319 20
" 19, " 1, S. part .....	253 08			253 08
" 20, " 1, Brok .....	499 89			499 89
" 21, " 1, " .....	468 02		1 76	468 02
" 22, " 1, N. 1/2 .....	49 97			49 97
" 16, " 2, E. 66 .....	8 55			8 55
" 16, " 2, Centre .....	29 26			29 26
" 16, " 2, W. 68 .....	193 42			193 42
" 17, " 2, Brok .....	583 30			245 60
" 18, 19 and 20, con. 2, Brok .....	1,312 14			858 10
" 21, Con. 2, .....	449 75	46 72		449 75
" 22, " 2, .....	45 98			45 98
" 17, " 3, S. 1/2 .....	35 91			35 91
" 18, " 3, S. 1/2 .....	45 98			45 98
" 19, " 3, S. 1/2 .....	} 27 83	91	11 45	27 83
" 20, " 3, S. 1/2 .....				
Proportion due by Township .....	198 55			198 55
	<u>5,110 49</u>	<u>71 28</u>	<u>13 21</u>	<u>4,318 75</u>

Statement showing amount paid out of General Funds to meet Drainage Debentures and Coupons.

To 19 Drainage Debentures and Coupons paid .....	\$5,157 18	
By amount collected from Property Owners as above .....		\$4,318 75
By balance paid from General Funds .....		838 43
	<u>\$5,157 18</u>	<u>\$5,157 18</u>

## INDEX.

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	PAGE		PAGE
Eastnor Township .....	7, 9-51	Public Utilities .....	6
Gloucester Township .....	7, 52-61	Tay Township .....	7
Howard Township .....	7	Tiny Township .....	7, 62-69
Newmarket Town .....	8	Tisdale Township .....	7
Municipal Reform .....	6	Uniform Accounting .....	5
Plantagenet, South, Township .....	7		

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TWENTY-EIGHTH ANNUAL REPORT

OF THE

COMMISSIONERS

FOR THE

Queen Victoria Niagara Falls Park

1913

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PRINTED BY ORDER OF  
THE LEGISLATIVE ASSEMBLY OF ONTARIO

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TORONTO :

Printed and Published by L. K. CAMERON, Printer to the King's Most Excellent Majesty

1914

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29-37 Richmond Street W.  
TORONTO.

COMMISSIONERS FOR THE QUEEN VICTORIA NIAGARA  
FALLS PARK.

---

JOHN W. LANGMUIR, Chairman, Toronto.

P. W. ELLIS, Toronto.

GEORGE H. WILKES, Brantford.

COLONEL L. CLARKE RAYMOND, K.C., Welland.

LIONEL H. CLARKE, Toronto.

WILLIAM L. DORAN, Niagara Falls.

JAMES D. CHAPLIN, St. Catharines.

---

JOHN H. JACKSON, C.E.  
Superintendent.

J. HARRISON PEW,  
Assistant Superintendent.

HENRY J. MOORE,  
Chief Gardener.





PARLIAMENT BUILDINGS,

TORONTO.

*To His Honour* SIR JOHN MORISON GIBSON, Knight Commander of the **Most Distinguished Order of St. Michael and St. George**, a Colonel in the Militia of Canada, etc., etc., etc.

*Lieutenant-Governor of the Province of Ontario.*

MAY IT PLEASE YOUR HONOUR:

I beg to submit herewith the Twenty-eighth Annual Report of the Queen Victoria Niagara Falls Park Commission, 1913.

I have the honour to be,

Your Honour's most obedient servant,

W. J. HANNA,  
Provincial Secretary.



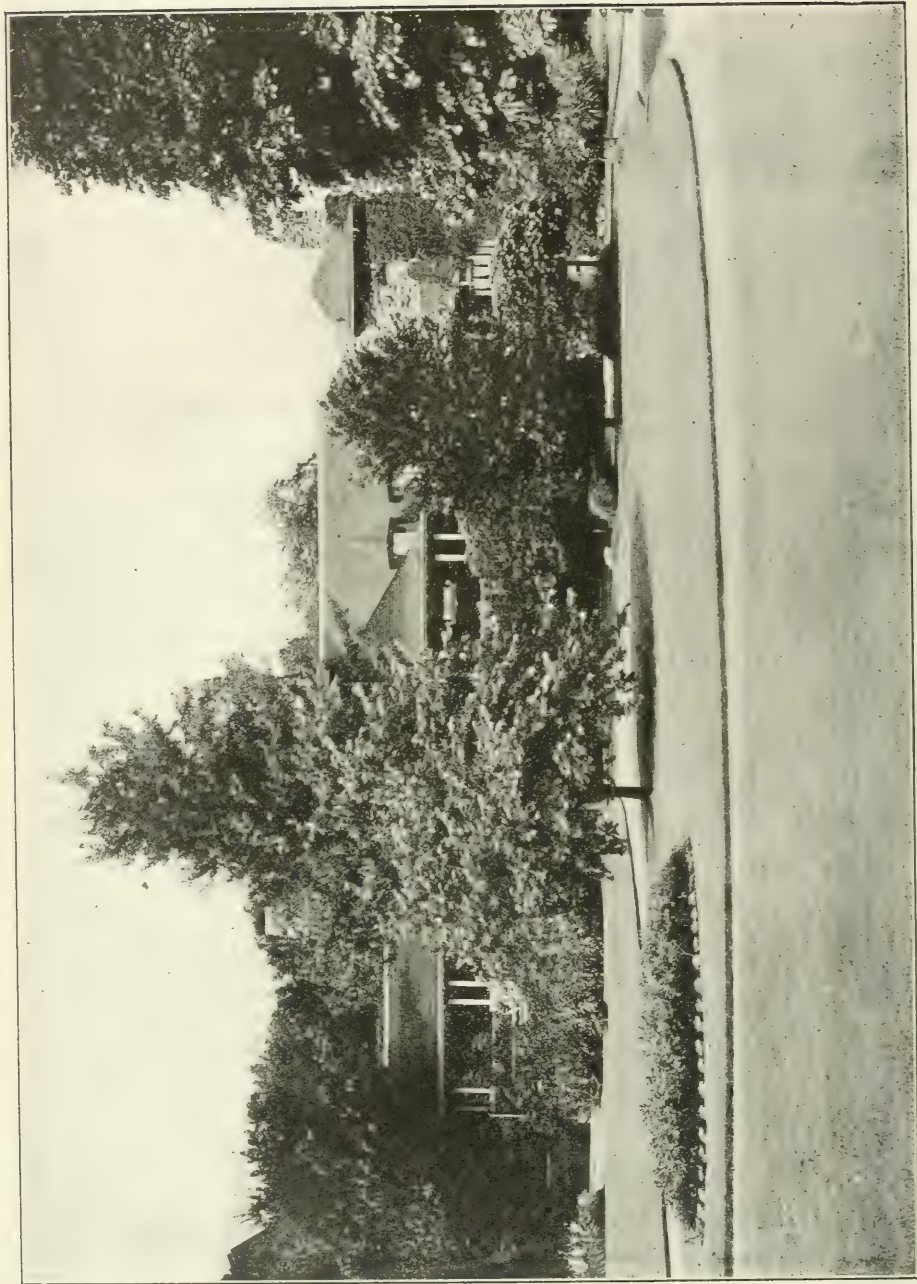
*To the Honourable W. J. HANNA, K.C., M.P.P., Provincial Secretary, Province of Ontario, Parliament Buildings, Toronto.*

SIR,—I have the honour to transmit herewith for presentation to the Legislature of Ontario the Twenty-eighth Annual Report of the Commissioners for the Queen Victoria Niagara Falls Park (being for the year 1913), together with the statements of receipts and expenditures, and other documents connected with the Report.

I have the honour to be, Sir,  
Your obedient servant,

J. W. LANGMUIR,  
Chairman.

TORONTO, April 11th, 1914.



Administration Building, Queen Victoria Park.



TWENTY-EIGHTH ANNUAL REPORT  
OF THE  
Commissioners for the Queen Victoria  
Niagara Falls Park.

---

*To the Honourable SIR JOHN MORISON GIBSON, K.C., LL.D.,  
Lieutenant-Governor of the Province of Ontario, Toronto.*

MAY IT PLEASE YOUR HONOUR:

The Commissioners for the Queen Victoria Niagara Falls Park System present herewith their Twenty-eighth Annual Report, being for the year ended 31st December, 1913.

Appended to the report will be found the financial statements exhibiting the receipts from all sources for the year, and the expenditures on Capital and Maintenance Accounts for the same period; also the annual report of the Park Superintendent, and other documents showing the operations for the twelve months covered by the report.

A summary of all receipts and expenditures connected with the entire Park System from the date the Commission was organized in 1885 was given in the report of last year; also a summary of the more important unfinished works that the Board contemplated proceeding with when funds were available in order to practically complete that portion of the Park System overlooking the Falls and Upper Rapids known as the "Queen Victoria Park," in connection with which the hope was expressed that the works and structures referred to would be commenced in the early part of 1913. Inasmuch, however, as the Statutory period that the Commissioners were authorized to collect rents and revenues derived from the three power companies expired on the 31st December, 1912, it became necessary before these works could be undertaken to have the Park Act amended so as to enable the Commissioners to continue the collection of such revenues for a further period. Application was accordingly made to the Government to have the Park Act amended and the time for the collection by the Commissioners of the revenue referred to extended for a further period of five years. The application was approved by the Government, and the Act was amended as follows:—

1. Subsection 2 of section 21 of The Queen Victoria Niagara Falls Park Act is amended by striking out the figures "23" in the second line and substituting therefor the figures "24."

2. Section 22 of the said Act is amended by inserting after the figures "1912" in the fifth line the words and figures "1913, 1914 and 1915, 1916 and 1917."

3. The said section is further amended by adding thereto the following section:—

23a. Before any expenditure on capital account is made out of such revenues and rentals in respect of any works within the Park or on premises under the control of the Commissioners, the estimates therefor shall be submitted to and approved of by the Lieutenant-Governor in Council.

4. The said Act is amended by adding the following section:—

23b. All revenues and rentals which are not required for the purposes set out in sections 21 and 23, shall on or before the first of July in each year be paid over by the Commissioners to the Treasurer of Ontario, and shall form part of the Consolidated Revenue Fund of Ontario.

The passing of the amended Act as quoted, with the clause requiring all proposed expenditures on Capital Account to be approved by the Lieutenant-Governor in Council, necessitated the preparation of revised and fully detailed estimates of cost of all proposed structures and works of a capital nature for the sanction of the Lieutenant-Governor in Council. This approval was not received by the Board until the 5th June, 1913, being too late to have working plans and specifications prepared for such works as the new conservatories, the table rock house, parapet wall, aquatic garden and other constructions of an important character. The works on capital account, which were fully set out in last year's report, had therefore to be abandoned for the year.

It should also be stated that in the preparation of the estimated receipts for 1913, the Commissioners fully expected, as the result of the favourable decision rendered by the Privy Council in the case of the "Attorney General vs. Canadian Niagara Power Company," that that company would at once have paid the claim found to be due under the judgment, amounting to \$52,435.37 up to November 30th, 1912. Settlement, however, was not made by the Power Company until December, 1913. It was also expected, following the decision of the Privy Council in the case of the Canadian Niagara Power Company, as the claims were admittedly of the same character, that the Ontario Power Company and the Electrical Development Company would forthwith have settled the amount claimed by the Commissioners for excess rentals due by these companies respectively. Up to the present time, however, no payment has been made.

In justice to the Park Commissioners, it is but right that the reasons for the complete stagnation in capital works should be recorded.

#### NEW CONSERVATORIES.

Included in the estimates for new structures was the much needed but long deferred project of new conservatories which has been referred to so frequently in the latter reports of the Commissioners. After a careful examination of the various sites that were thought to be suitable for the new conservatories, the Commissioners decided that the point immediately under the western bank of the southerly portion of the Queen Victoria Park, midway between the power houses of the Canadian Niagara Power Company and the Electrical Development Company, would be the best not only in regard to location, but as possessing the requisite area for an extension of the buildings when required.

As this site is in close proximity to the Ontario Power Company's underground conduits (only two of which have yet been placed) the Commissioners decided that it would not be safe to commence work on the conservatories until assurance was had from the Ontario Power Company that they would proceed with

the placing of the third and last conduit which, under their agreement, they are entitled to construct. With the completion of this third tube the disturbance of the Park surface, which has extended over a period of ten years, would be practically ended, and the Commissioners would be able to proceed with the remaining works of restoration, including the conservatory structure.

On the 5th February, 1914, the Commissioners were notified by the Ontario Power Company that at the expiration of three months from that date they proposed to commence the construction of the overflow or regulating device for Pipe No. 3. It is important, therefore, in order to do away with any further disturbance to the Park surface, that the construction of the new conservatories by the Commissioners and the laying of the third pipe by the Ontario Power Company should be proceeded with simultaneously.

#### TABLE ROCK HOUSE.

The proposed construction of a suitable building to take the place of the old unsightly structure overlooking the Falls has been under the consideration of the Commission for many years. Now, however, that the descent under the Falls has become one of the most popular features of the Park System, it is important—both from the standpoint of improving scenic effects, as well as providing the requisite space for the combined purposes of a shelter from the spray conditions, dressing rooms for visitors going under the Falls and other purposes—that the old building should be demolished and a new one erected of a more appropriate design for a public park.

Two plans in connection with this structure have been carefully considered by the Commissioners: (first) the placing of the new structure at the base of the escarpment in rear of the present building, with an elevator to the high altitude overlooking the Falls or (second) to construct a suitable building, not exceeding an altitude of twenty feet, south of the old Table Rock House and in close proximity to the International Railway which carries most of the visitors.

It was found that the first plan would be very expensive, not only in the original construction, but in future care and maintenance. The second plan was therefore agreed to by the Commissioners and sketches are being prepared of the structure which, when completed, will be about one hundred feet in length, forty feet in width, fifteen feet high, with wide verandahs surrounding the entire structure for the purposes of shelter. By the adoption of this plan, not only will the cost of the building, as compared with the first plan, be greatly reduced, but it will obviate the necessity for the reconstruction of a considerable portion of the tunnel forming the descent under the Falls.

The proposed structural changes will not only greatly improve scenic effects at this greatly congested point in the Park, but will also permit of the construction of roads and paths leading along the base of the escarpment to the proposed site for the new conservatories and on to Dufferin Islands, thus opening up new vistas with greatly improved views of the Upper Rapids.

#### OUTLYING PARKS.

The outlying territory of the Park System has not been added to during the year, but negotiations have been commenced for the acquirement of about seventeen acres of additional land with a view to extending the Queenston Heights Park to the Niagara River Gorge thus affording a magnificent view of the lower river.



This historic Park and Lower Rapids at Queenston Heights is one of the chief attractions of the Niagara Falls Park System, and even with the inadequate restaurant facilities, last year surpassed all previous records in daily average attendance of visitors.

#### THE BOULEVARD SYSTEM.

The Commissioners are pleased in being able to report the practical completion of the Niagara River Boulevard Roadway from the Park proper (Queen Victoria Park) to Bridgeburg, but it is a matter of regret that this splendid Niagara River highway has not been continued through the two Villages of Bridgeburg and Fort Erie. The Commissioners offered to build the roadway through these Municipalities on the basis of the Park assuming sixty-five per cent. of the cost of the work and the two interested villages paying the remaining thirty-five per cent., with the cost of maintenance to be equally divided between the Commissioners and the villages. This offer, however, was rejected, and in consequence the road has remained in its present almost impassable condition through the main street of these municipalities. It was considered that this arrangement was most generous to the two villages, following as it did along the lines of the arrangement made with the City of Niagara Falls for the maintenance of a similar roadway where the Commissioners have an interest for Boulevard purposes.

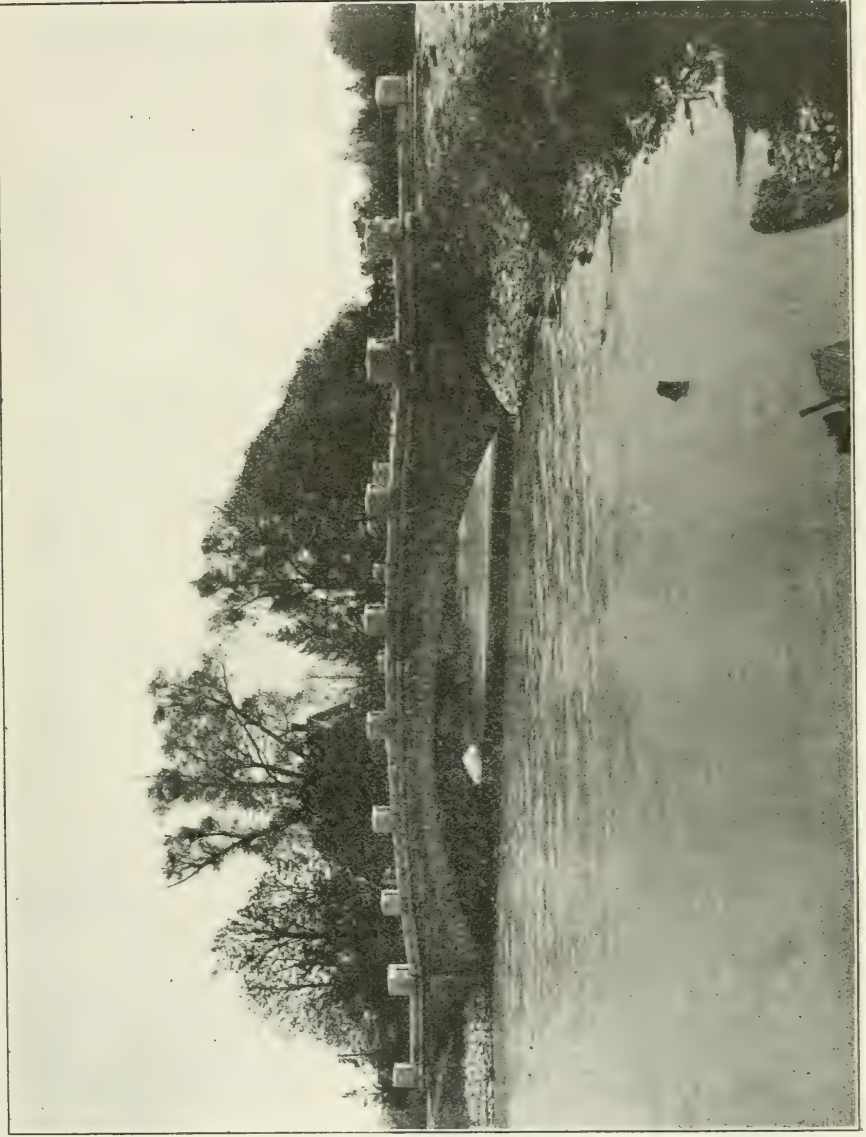
Respecting the extension of the boulevard northerly from Niagara Falls to the Whirlpool, Queenston, and on to Niagara-on-the-Lake, the only serious difficulty in construction will be in the vicinity of the Whirlpool, and the connection between the Upper and Lower Plateaux at Queenston Heights. If the Boulevard is constructed to follow a direct route parallel with the electric railway and overlooking the River, a rather costly embankment or viaduct structure will require to be built, chiefly at the Whirlpool. The road, however, would be one of the most picturesque on the continent.

The construction of a boulevard from the Park along the bank of the Niagara River to Bridgeburg was necessary for many reasons, but primarily in order to obtain access to the Park from the south, and in some respects it is equally important that it should be extended along the Gorge of the river northwards so as to have a continuous public driveway of a high class character along the shores of the Niagara River between Lake Erie and Lake Ontario, and looking to the future when settlement and population increases, as it is sure to do in this one of the most interesting parts of Ontario, it will be in the best interests of the public that the Government of Ontario should, through such a Boulevard System, control the whole of the shore line of the River Niagara between the two lakes.

The boulevard territory, which is one hundred feet wide, provides not only a high class modern roadway, but is in fact, from an aesthetic point of view, one of the most important parts of the Park System in practically assuring to the public for all time to come a continuous Park from Lake Erie to Lake Ontario. We have only to look at the opposite shore line of the Niagara River in the State of New York, where the River is defaced by all kinds of structures, and the State itself is shut off from the use and occupation of this grand river, in order to have practical proof of the wisdom of securing the land adjacent to the river.

In order to correct the idea that prevails in some quarters that over \$400,000 was expended in the construction of less than twenty miles of a roadway, it is





Black Creek Bridge, Niagara River Boulevard.



only necessary to give the details of expenditures in order to prove the fallacy of such a statement, as follows:

Acquirement of Land .....	\$100,239 51
Shore Protection from erosion .....	27,867 89
Road Construction .....	205,086 89
Bridge Construction .....	30,554 37
Landscape Decoration .....	47,705 33
General Construction and interest charges .....	26,476 00
	<hr/>
	\$437,929 30

#### POWER COMPANIES.

During the year the three power companies have been engaged in various constructions in furtherance of their development, both in the completion of structures and the installation of additional machinery.

*The Canadian Niagara Power Company* has entirely completed its power house to cover the plant and machinery necessary for the generation of the one hundred thousand horse-power which it is authorized to develop. It has also removed the temporary structures to the south of the building, and generally, restored the grounds to conform to the requirements of a public park.

The alterations and changes for the improvement of the company's forebay have not yet been proceeded with, so that the surface of this portion of the park has not been disturbed.

*The Ontario Power Company* having obtained permission to extend its second conduit to provide for Units Nos. 13 and 14 was employed during the year in the construction of that work until well on in the summer season, contrary to the expectation of the Commissioners, thus exceeding the time limit stipulated when the work was to have been finished. This delay, in addition to causing considerable inconvenience to the summer tourist, had the effect of leaving the front of the Administration Building in an unfinished appearance until late in the year.

During the year the Company intimated to the Commissioners that the entire power producing capacity of their plant was about exhausted by their contract requirements, and that it would be necessary in the immediate future to undertake the construction of the third and last conduit line from the Gate House at Dufferin Islands under the Park surface to the Power House below the Falls of Niagara. In connection with this extension a proposition was made by the Company in July, setting out that the Ontario Power Company claimed certain rights to withdraw water from the Welland River in addition to existing rights to withdraw water from the Niagara River at its intake at the Dufferin Islands.

It was proposed by the Company to amalgamate these two water withdrawals so as to take their entire water supply at the present Niagara River Intake. It was further proposed to carry the water by means of a tunnel in the solid rock under the bed of the Niagara River and extended to a power house outside of the Park limits and immediately south of the Company's present transformer station. The water from this power house would be carried into the lower river by tail race tunnels discharging south of the Ontario Power Company's Power House in the Gorge. In this new proposition it was stipulated, however, that the Ontario Power Company should be allotted one-half of the volume of water permitted to be diverted in Canada from the waters of the Niagara River above Niagara Falls under the terms of the Waterways Treaty with the United States, viz.: Eighteen thousand cubic feet per second.

From the standpoint of the Park Commission in the development of the Park, the proposed method of generating the additional power would be a distinct advantage inasmuch as no further surface disturbance would take place between the Dufferin Islands and the Administration Building a distance of over one mile. The acceptance of the proposition would also have another distinct advantage in doing away with any further buildings in the Park, more particularly at the congested space in and around the Administration Building.

Owing, however, to the condition attached to the proposition that a largely increased volume of water should be given to the Company for power generation, notwithstanding the advantages referred to, the Commissioners were obliged to reject the proposition.

*The Electrical Development Company* has entirely completed its power house and has removed the temporary structures that were required for construction purposes. The space surrounding the power house will now be available for Park restoration, thus greatly improving the appearance of this important section bordering on the Upper Rapids.

Early in the year this Company filed plans for an underground conduit system to extend from their power house through the Park to the Upper Steel Arch Bridge, and thence into the United States. This new outlet for power transmission was planned to be located parallel with the tracks of the International Railway Company, involving a surface excavation for over a mile and a half, with perhaps more serious results in the permanent heating effects upon vegetation that such a system entails. The Commissioners therefore did not view the application favorably, and it still stands in abeyance.

#### RECEIPTS AND EXPENDITURES.

A complete statement of the Receipts and Expenditures for the year ended 31st December, 1913, with all details connected therewith, will be found in the appendix. The total revenue for the year amounted to \$235,436.62, namely: Fixed rentals derived from the three power companies, \$60,000; additional rentals from the same source, \$150,273.20, and miscellaneous revenue from the International Railway Company and other franchises amounting to \$25,163.42.

Late in the month of December, after many conferences, the Canadian Niagara Power Company decided to pay the additional rentals which had accrued from the time that the Company had generated over 10,000 horse power, based on the scale of charges claimed by the Park Commission and finally determined by the judgment of the Privy Council. Having regard, however, to the suggestion contained in the last paragraph of the judgment to the effect that it would be reasonable to compute the rentals by treating "each yearly or half-yearly period as distinct and self-contained," it was decided to receive from the company, without prejudice, the amount that would be due as if each half-yearly period was considered separately. Calculated on this basis the amount due by the Canadian Niagara Power Company was \$55,000.00 (of which \$48,103.70 was for the period ended November 30th, 1912). This amount is greater than normal owing to the back payments with interest extending from the year 1906. In the report for 1912, the amount owing was shown to be \$52,435.37. This, however, was computed without reference to yearly or half-yearly periods.

The \$65,000 four per cent. debentures authorized by the Legislature for boulevard purposes remaining unsold owing to the condition of the money market have now to be realized on to meet expenditures made on the boulevard.



The Capital Expenditure at Queen Victoria Park, the Outlying Parks and the boulevard aggregated the sum of \$56,967.18, and the Maintenance Expenditures for salaries, wages, materials and other items of upkeep for the whole Park System to \$68,308.99. The interest upon debentures and bank charges during the year amounted to the sum of \$33,826.23.

All which is respectfully submitted.

J. W. LANGMUIR, *Chairman.*

GEORGE H. WILKES.

P. W. ELLIS.

L. CLARKE RAYMOND.

WILLIAM L. DORAN.

L. H. CLARKE.

J. D. CHAPLIN.

Toronto, April 11th, 1914.

## QUEEN VICTORIA NIAGARA FALLS PARK SYSTEM.

## FINANCIAL REPORT, 1913.

## RECEIPTS.

Ontario Power Company, rental .....	\$30,000 00	
Ontario Power Company, excess rental .....	44,700 00	
Canadian Niagara Power Company, rental .....	15,000 00	
Canadian Niagara Power Company, excess rental .....	86,109 20	
Electrical Development Company, rental .....	15,000 00	
Electrical Development Company, excess rental .....	19,464 00	
Zybach Estate, rental .....	11,250 00	
International Railway Company, rental .....	10,000 00	
Brock's Monument tolls .....	1,794 15	
T. W. Midforth, rental .....	1,230 00	
Wharf privileges .....	502 00	
Sundries .....	387 27	
		<u>\$235,436 62</u>

## EXPENDITURES.

## CAPITAL ACCOUNT:

*Queen Victoria Park:*

Equipment, Park and Boulevard .....	\$1,863 36	
Drainage and Water Connections .....	1,196 42	
Experimental Roads .....	1,147 17	
Improvements and parking Dufferin Islands .....	956 46	
Extension to plant storage .....	684 68	
New Roads and Paths .....	175 50	
Improvements to Administration Building .....	75 00	
Office Equipment .....	28 98	..
Trees, shrubs and plants .....	7 80	
		<u>\$6,135 37</u>

*Queenston:*

Improvements to road and new paths .....	\$306 45	
Lands at Heights .....	5 48	
		<u>\$311 93</u>

*Niagara Glen:*

New paths and planting .....	\$230 45	
		<u>\$230 45</u>

*Lundy's Lane Burying Ground:*

Fencing, grading, paths and planting .....	\$381 81	
		<u>\$381 81</u>

*Niagara River Boulevard:*

Sections 2A and 2B .....	\$17,530 94	
Bridges .....	686 87	
Roadway Construction .....	667 02	
		<u>\$18,884 83</u>
Grading, drainage and planting .....	18,411 91	
Lands and moving buildings .....	4,364 15	
Rip-rap protection .....	917 50	
		<u>\$42,578 39</u>
Legal .....		<u>\$7,329 23</u>
Amount carried forward .....		<u>\$56,967 18</u>

## MAINTENANCE ACCOUNT:

*Salaries:*

Office and clerical staff for Park System .....	\$11,790 00	
Constables, Queen Victoria Park .....	7,020 00	
"    Queenston . . . . .	780 00	
"    Niagara Glen .....	660 00	
"    Lundy's Lane .....	319 59	
"    Fort Erie .....	351 02	
		<u>\$20,920 61</u>

*Wages:*

Queen Victoria Park .....	\$20,411 90	
Queenston . . . . .	2,272 14	
Niagara Glen .....	507 60	
Lundy's Lane .....	578 57	
Niagara River Boulevard .....	4,613 34	
Fort Erie .....	24 00	
		<u>\$28,407 55</u>

*Materials:*

Queen Victoria Park .....	\$9,735 64	
Queenston . . . . .	575 89	
Niagara Glen .....	50 50	
Lundy's Lane .....	59 57	
Niagara River Boulevard .....	6,255 10	
Fort Erie .....	44 08	
		<u>\$16,720 78</u>

*Office Expenses:*

Travelling Expenses .....	\$584 38	
Supplies, postage, etc. ....	933 87	
		<u>\$1,518 25</u>
Commissioners' Expenses .....	\$232 20	
Insurance . . . . .	\$509 60	
Interest on daily overdraft .....	\$742 76	
Interest and charges on Debentures .....	33,083 47	
		<u>\$33,826 23</u>
		<u>\$159,102 40</u>
Overdraft in Imperial Bank, January 1st, 1913 .....	18,230 98	
1913, DECEMBER 31, BALANCE IN BANK .....	58,103 24	
		<u>\$235,436 62</u>

NOTE.—There is also a balance of \$1,000 in the Queen Victoria Niagara Falls Park Current Account (Accountable Warrant).

## SPECIAL SAVINGS ACCOUNT, 1903-1913.

For Maintaining water levels at Intake of Canadian Niagara Power Company and International Railway Company.

1903—January 31, deposited .....	\$25,000 00	
1905—December 30, interest to date .....	2,288 41	
		<u>\$27,288 41</u>
Less cost of Submerged Dam .....	2,189 32	
		<u>\$25,099 09</u>
1913—November 1, interest to date .....	6,591 07	
		<u>\$31,690 16</u>

## REPORT OF PARK SUPERINTENDENT.

*To the Commissioners for the Queen Victoria Niagara Falls Park.*

GENTLEMEN,—I beg to submit herewith the report of operations for the year 1913, giving full details of the works of maintenance and improvement carried on in the Queen Victoria Niagara Falls Park System.

While the spring of 1913 was rather late, and the early weather conditions severe for tree and plant life, the remaining months from April on were unparalleled for Park operations, and the favorable season continued to the very end of the year. With such a splendid opportunity it is unfortunate that more was not accomplished during the last twelve months in the betterment of the various areas of the Park System, but owing to a number of conditions which the department had no control over, it was late in the summer before much of the work was put under way. In the first place the estimates were late in being approved, and upon boulevard work much delay was experienced from one of the contractors in the finishing of a five mile section of roadway, and this had finally to be taken over by the Park staff and completed. While this work finished the roadway for the boulevard as far as Bridgeburg, it meant the removal of the maintenance staff from the remaining sections, and consequently the upkeep was not provided for as it had been hoped.

The estimates of expenditure as finally approved provided for the extension of the massive stone and iron parapet wall along the front of the Park from Rambler's Rest to the Clifton Incline, and the erection of the proposed memorial to Burrel Hecock who lost his life in the ice bridge catastrophe of 1912. Some improvements were contemplated at the Dufferin Islands, and it was decided to improve the Administration Building by adding to the office space in the basement. At Queenston the main Niagara Falls-Queenston roadway was to be improved and macadamized, while an iron fence was to be built along the edge of the cliff for the safety of visitors. At Niagara Glen an iron fence was to be built along the edge of the cliff, and new paths constructed to provide visitors with an opportunity of seeing more of that wonderful natural park. At Fort Erie a new tool house was proposed with some planting and the installation of a water supply. A new roadway providing entrance to Butler's Burying Ground was included, and at Lundy's Lane Cemetery the additional area placed under the control of the Commissioners was to be fenced, and the whole plot properly graded for more readily taking care of the maintenance. It was also contemplated that a beginning should be made on the proposed new conservatories at Queen Victoria Park, and that some additional land at Queenston Heights should be purchased for the rounding out of that area. The work of proceeding with the completion of the Niagara River Boulevard was to be continued, and it was planned to build the boulevard connection through the Villages of Bridgeburg and Fort Erie on the basis of co-operation by those two municipalities. The close of the year, however, finds many of these items only begun, and some of the larger and more important untouched, and still remaining to be taken up in 1914.

The conservatory project has been proceeded with to the extent of having sketch plans prepared, but no design has yet been accepted for the new structure. It had been hoped that the other main plan of the Commissioners to build a new Table Rock House would have been included in the programme for the year,



but in the endeavor to make the expenditure come within the revenue this had to be sacrificed at the very start. Altogether only about one-half of the amount proposed upon capital expenditure was undertaken.

### QUEEN VICTORIA PARK.

The main office space, owing to the increase in administration duties, has become altogether inadequate for the needs of the Park System, and some plans have been prepared looking to the extension of the space available by taking over the large public rest room. In addition, however, to curtailing the space needed by the public this did not altogether lend itself to office room, and consequently it was abandoned, and the unexcavated portion of the basement has been taken in hand and is now being fitted up for a vault space and filing equipment for the documents not often required. In addition to this a drafting room has been secured above the main offices, part of the photographic space originally used by the tenant of Table Rock franchises. Thus for the present the staff will be taken care of in a fairly adequate manner by using every foot of the area available.

The two new ranges of greenhouses added to the conservatory equipment for temporary requirements necessitated a large addition to the heating equipment of the plant, and this was only made possible by curtailing the cool storage which was already overcrowded with semi-tropical subjects. The enlargement of this building has, therefore, been accomplished giving the much needed additional room for this important part of Park work.

Section 3 of the standard parapet wall along the front of the Park was prepared for contract late in the season, and advertised for tender. This was let toward the end of the year to be constructed in the spring of 1914. This contract will provide an extra length of six hundred and eighty-five feet of stone work, and in addition a small length of three hundred and fifty-eight feet is being built in front of the Administration Building. With the completion of this contract there will remain only one section of some five hundred feet to complete the entire length of parapet from the Horseshoe Falls to the Clifton Incline.

The work of draining along the foot of the escarpment which has been proceeding and undertaken by a section each year was added to in 1913, in the vicinity of the cricket crease, and a noticeable improvement was made in the condition of the grounds which are now available for use much earlier in the season. In connection with this work the better springs were located and tapped into reservoirs for the purpose of connecting up a spring water supply. The collecting basins are made of concrete and arranged for inspection and cleaning out to keep them in a sanitary condition.

The Ontario Power Company's head works located at the Dufferin Islands has created a very different condition in that part of the Park from that which nature provided, and in the new arrangement which was authorized by agreement permitting the Company to change the natural flow of the river, new land was created and new islands built both in the Niagara River and in the Dufferin Islands channel. These changes have had the effect of raising the water levels and increasing the difficulty for the natural tree growth to maintain itself. In addition to this, the new land built upon rock fill is of shallow depth, and does not sustain the new growth that has been set out. Much improvement in this

area was effected by undertaking the removal of dead and diseased trees, and opening up to the light smaller specimens which were being crowded out. It is proposed to practically abandon the deciduous growth heretofore planted upon the islands which are altogether too high above water level with the small amount of top soil, and in place of this to construct a plantation of the natural growth of pines and cedars. The surrounding escarpment, known as Burning Springs Embankment, undertaken for improvement in 1911 and 1912, will form a splendid setting for this new work, and with its natural growth already being added to, the whole feature will be distinctly pleasing and attractive.

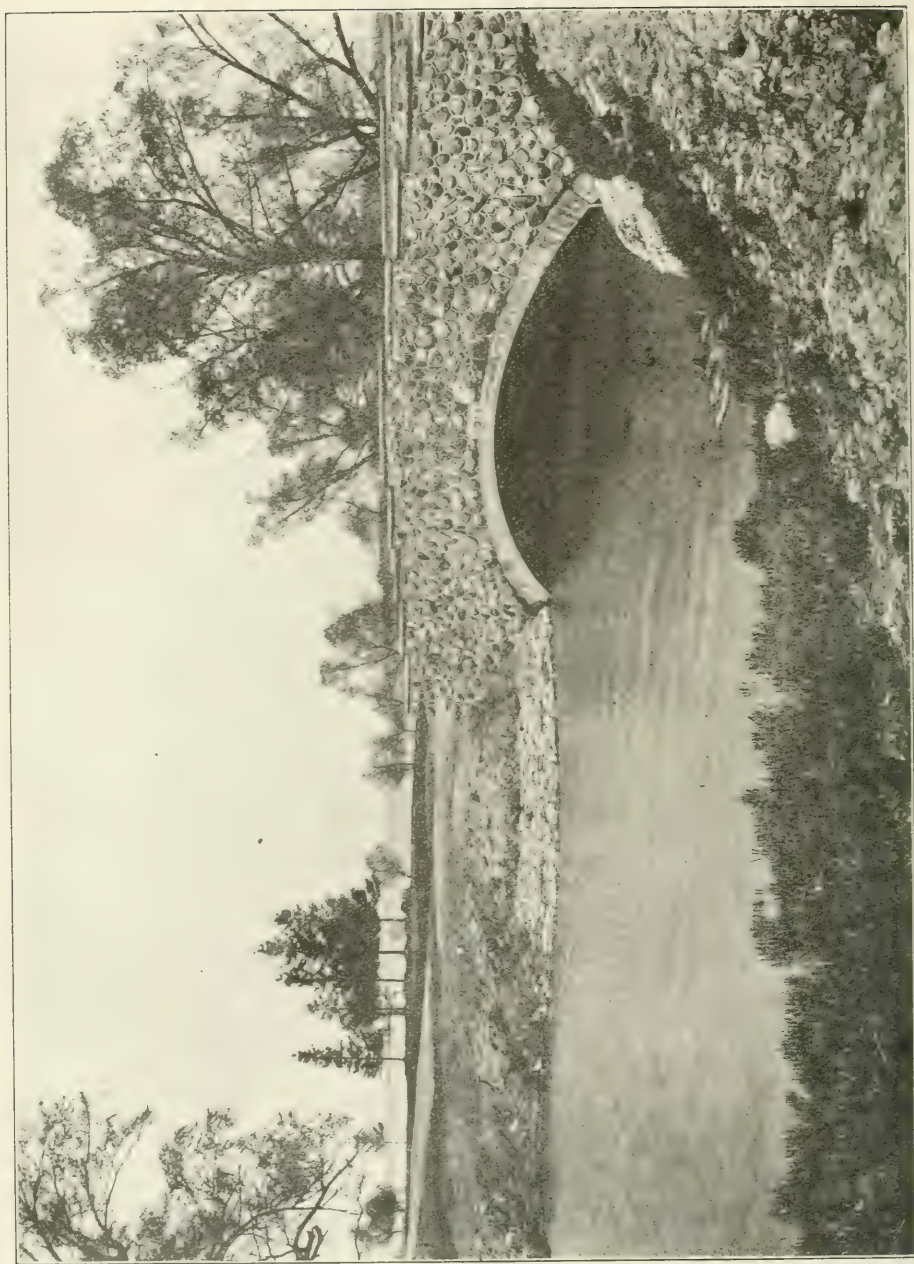
One feature at the southerly end of the Park from Table Rock House to the Dufferin Islands will require careful attention during the next several years. It is found that the conduits of the Ontario Power Company are not by any means watertight, and several extended areas along this line are partially flooded from the leaks which have considerable force owing to the pressure in the eighteen foot pipe. It appears that this condition will have to be properly taken care of at least when the third pipe line is constructed before that section of the Park, a mile in length, can be said to have been restored to its original condition.

All of the ordinary maintenance work within the Park proper has been taken care of during the year, including the maintaining of the roads, the pruning of trees and shrubs, and the cultivation of herbaceous stock for summer display. In the early part of the year the heavy crib work protecting the escarpment side for the roadways to the Transformer Houses of the Canadian Niagara Power Company and the Electrical Development Company gave way owing to decay in the timbering, and the work of repairing this structure had to be undertaken at a considerable cost. It seems that more of this repair work will require to be done shortly as the timbers become weakened. In the road department the maintenance of the macadamized roadways is entailing a large item of expenditure particularly from the heavy teaming caused by power company construction. The usual treatments of asphalt were completed early in the season and blinded in with fine lime-stone and in some cases gravel, but with the heavy traffic this was found to cut through in places, and a rutted condition was the result. To properly repair this a new method was adopted last year, namely, to apply the rocmac process to each separate depression and rut. The worn area was carefully picked out to a depth of about three inches, and limestone screenings mixed with the rocmac solution placed in the bottom. Two inch limestone was then added; and the whole rolled and consolidated to form a new crown to conform to the section of the original roadway. This method has been particularly successful on the main drive which has perhaps the largest and heaviest traffic of any road on the Park System. With the asphaltic oil applied hot to this surface the road was satisfactory for traffic all during the season.

In the fall of 1911 an experiment was tried with very heavy asphalt running to 90 per cent., remaining as a residuum after the distillation of the lighter oils from natural asphaltic products. The manner of this construction was to lay two inch stone upon a consolidated subgrade and pour in the asphalt heated to about two hundred degrees, and then to roll the metal thoroughly after blinding in with fine limestone. This plan proved successful in consolidating the road metal, and but for a small area that was constructed in cold wet weather where a proper bond could not be obtained, the roadway was very satisfactory for traffic, and entirely shed water without allowing it to penetrate through.







Boyer's Creek Bridge, Niagara River Boulevard.



Another improvement completed during the year was the removal of one of the spans of the large iron through bridge used for the tracks of the International Railway Company at the outlet of the Dufferin Islands elbow. In early days this channel was wide enough to require two full bridge spans, but with power company constructions and alterations incident thereto one span has remained for several years upon rock fill while the other spanned the contracted channel. The clearing away of this structure opened up the way for an improved entrance to the Dufferin Islands driveway which skirts the water of the elbow around the bend in the escarpment to the Burning Springs hill. This entrance has been removed southerly to cross the tracks of the International Railway Company at right angles, and provides a wide entrance for carriage traffic.

#### QUEENSTON HEIGHTS PARK.

Although it was impossible to undertake the work of macadamizing the main driveway through this Park to the Village of Queenston, owing to the entire roller equipment being used upon boulevard construction, yet with the ordinary Park force gutters were constructed and the drainage improved while the road itself was crowned to shed the water quickly to the side ditches. In addition to this a new heavy type of wooden fence on the escarpment side of the road was constructed of cedar from timber that had been cut from the side hills to thin out and allow of proper growth for the remaining trees. While this structure is not as permanent as an iron pipe fence it will last for many years and it utilizes material that would be wasted and the cost is very nominal. The usual high standard of upkeep has been maintained at this Park which is still increasing in its popularity for boat picnics coming in by way of Niagara-on-the-Lake and Queenston. The concessions at Queenston have been operated in a very satisfactory manner, and all the wants of the public have been amply taken care of and no complaints registered.

The other outlying areas including Niagara Glen, Lundy's Lane Cemetery, the old fort grounds at Fort Erie were all effectively maintained for the year, and in addition considerable clearing of the entrance area at the Glen was undertaken with the removal of dead timber and underbrush. New paths were constructed, and upon the main pathway a cobble stone pavement was laid at stretches where the water was washing away the surface.

#### NIAGARA RIVER BOULEVARD.

High water prevailed in the Niagara River during the greater part of the season, and this had the effect of preventing the undertaking of excavation at the mouths of the streams, and the riprapping at the entrances to the bridges, as had been planned. The finishing up of the parking of this parkway between Chippawa and Bridgeburg was pushed forward during the whole of the summer months with the result that only a small amount of planting remains to be completed south of Black Creek, while about two miles and a half of that work requires to be done between Black Creek and Chippawa. It was stated in the report for 1912 that all of the grading and planting would probably be finished by the end of the season 1913, but owing to the hindrance caused by the road contractors this expectation was not fulfilled because the planting could only proceed after the roadway was finished. In finishing up the five mile stretch of macadamizing comprising Section No. 2 of roadway construction the department gathered some interesting cost data upon different operations. In order to make the road acceptable under the terms of the contract part of the mileage

required a light resurfacing, and another portion required the entire reconstruction of the top courses. For these two operations the following figures will show in detail the amounts that were spent per square yard:

#### THE LIGHT RESURFACING WATER BOUND MACADAM ROADWAY.

*Time*—August 5th, 1913, to October 21st, 1913.

*Location*—Boulevard roadway from Slater's Dock, south.

*Average length of haul*—3.4 miles from M.C.R. siding, Chippawa.

*Area treated*—Length 14,625'=2.77 miles; width 18'=29,250 sq. Yards.

#### LABOR.

	Total.	Per Sq. Yd.
Loading 2" Stone and Screenings .....	\$232 56	8 cts.
Hauling . . . . .	442 95	1.51
Pumping and Watering .....	45 29	.15
Repairing roadway .....	275 18	.94
Rolling and Spiking .....	97 29	.33
	<hr/> \$1,093 27	<hr/> 3.73 cts.

#### MATERIAL.

2" Stone—205.5 tons at \$1.25 .....	\$256 88	.88 cts.
Screenings—150.2 tons at \$1.00 .....	150 20	.51
	<hr/> \$407 08	<hr/> 1.39 cts.

#### SUMMARY.

Labor . . . . .	\$1,093 27	3.73 cts.
Materials . . . . .	407 08	1.39
	<hr/> \$1,500 35	<hr/> 5.12 cts.

#### Remarks—

297 cubic yards of Stone and Screenings were placed on 29,250 square yards.

1 cubic yard of Stone and Screenings was placed on 98.5 square yards.

Ratio of 2" stone to screenings used—1 to .731.

Ton-mile cost of hauling materials—36.2 cts.

#### Wage rates:—

Teams . . . . .	55c. per hour.
Laborers . . . . .	22c. "
Foremen . . . . .	30c. "
Cost per mile .....	\$540 00

#### THE HEAVY RESURFACING WATER BOUND MACADAM ROADWAY.

*Time*—August 1st, 1913, to December 15th, 1913.

*Location*—Boulevard roadway, from Black Creek, North.

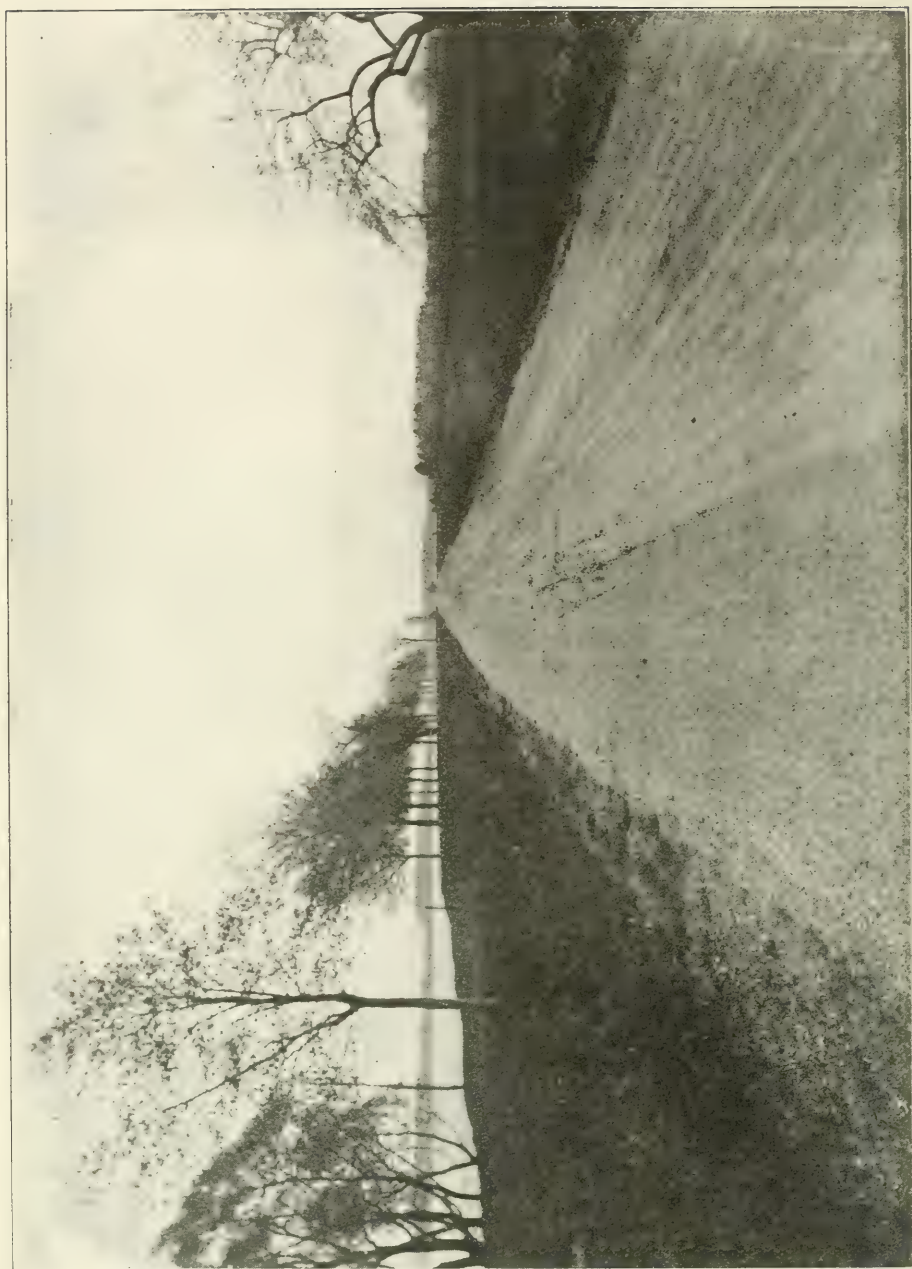
*Average length of haul*—1.98 miles from Black Creek siding.

*Area treated*—Length 14,467'=2.74 miles; width 18'=28,934 Square yards.

#### LABOR.

	Total	Per Sq. Yd.
Loading 2" Stone and Screenings .....	\$521 00	1.8 cts.
Hauling . . . . .	1,509 00	5.2
Pumping and Watering .....	215 00	.8
Repairing roadway .....	547 00	1.9
Rolling and Spiking .....	425 00	1.5
	<hr/> \$3,217 00	<hr/> 11.2 cts.





Bituminous Road, Niagara River Boulevard.



## MATERIAL.

2" Stone—750 tons at \$1.10 .....	\$825 00	2.9c.
Screenings—324½ tons at \$1.10 .....	357 00	1.2
	<hr/>	
	\$1,182 00	4.1c.

## SUMMARY.

Labor .....	\$3,217 00	11.2c.
Materials .....	1,182 00	4.1
	<hr/>	
	\$4,399 00	15.3c.

## Remarks:—

895.4 cubic yards of Stone and Screenings were placed on 28,934 square yards.  
 1 cubic yard of Stone and Screenings was placed on 32.3 square yards.  
 Ratio of 2" stone to screenings used—1 to .433.  
 Ton-mile cost of loading and hauling materials—32.3c.

## Wage rates:—

Teams .....	45c. per hour.
Laborers .....	20c. "
Foremen .....	30c. "

Cost per mile ..... 1,600 00

At Queen Victoria Park rates for teams .55c., and men .22c.; the above ton-mile cost would be 38.4c.

In connection with the scarifying and recrowning of this section of roadway a bituminous top was laid on a two and three-quarter mile length, and the following figures show the cost of different operations in connection therewith:

## TARVIA "A" AND ½" STONE SURFACING.

*Time*—September 2nd to October 16th, 1913.

*Location*—Boulevard roadway, vicinity of Usher's Creek.

*Length or haul*—3.4 miles.

*Area treated*—Length 14,625' = 2.77 miles; width 18'—0" = 263,250 square feet = 29,250 square yards.

*Depth*—½-inch.

## Costs.

	Total.	Per Sq. Yd.
Loading, hauling and placing stone .....	\$861 05	2.90 cts.
Loading, hauling and placing tarvia .....	353 71	1.19
Placing and removing plant .....	56 50	.19
	<hr/>	
	\$1,271 24	4.28 cts.

## Materials—

½" Stone—487.5 tons at \$1.30 .....	\$633 75	2.14 cts.
Tarvia "A"—14,307 gallons at 10c. ....	1,430 70	} 5.58
Freight, \$188.35; Demurrage, \$32.00 .....	220 35	
Soft Coal for heating and operating roller .....	88 90	.30
	<hr/>	
	\$2,373 70	8.02 cts.

## SUMMARY.

Labor .....	\$1,271 24	4.28 cts.
Materials .....	2,373 70	8.02
	<hr/>	
	\$3,644 94	12.30 cts.

2.77 miles cost .....	\$3,644 94
1 mile cost .....	1,300 00
1 square yard cost .....	12 30

This was a carpet treatment undertaken with refined tar, known as Tarvia "A." The material was shipped in tank cars to the nearest railway siding, and heated by means of a steam boiler to a temperature of 100° F. when it was forced by steam pressure into the distributing apparatus, and then hauled to the site of the work where it was attached to the steam roller. Connection was here made with the boiler and the material further heated to a temperature of between 175° and 200° F. Steam pressure at thirty-five pounds was then applied to spray it on to the road surface. The apparatus used is supplied at the rear with nozzles so constructed that upon the application of pressure the hot material is forced to the surface of the road in a fine spray. The heated tar penetrates the top surface, and the remainder is then absorbed by means of one-half inch stone chips in the proportion of one cubic yard over about sixty-five square yards of surface giving a depth of stone and tar equal to a little over one-half inch. The quantity of bituminous material for this treatment was one-half gallon to the square yard, and as indicated the total cost including labor was 12.3c. per square yard, or about \$1,300 per mile for an eighteen foot roadway. It is estimated that the only cost of upkeep to this surface will be an annual tar spraying of about one-eighth of a gallon per square yard at a cost of between three and four cents per square yard, or about \$320 per mile for an eighteen foot roadway.

In comparison with the heavy water bound macadam resurfacing it is interesting to note the details of figures for extra heavy resurfacing with a chemical binder. The following figures show the details of cost for a Rocmac resurfacing upon the main driveway of the Park where the road metal was four inches:

#### ROCMAC RESURFACING AT RAMBLER'S REST.

*Time*—May, 1913.

*Location*—Main driveway, opposite Rambler's Rest loop.

*Length of haul*—3,400'—644 mile, (from Victoria Park siding.)

*Area treated*—Length 370'; width 21'—7,760 square feet—863 square yards

*Depth removed*—4 inches.

*Material removed*—370' x 21' x 4"—2,590 cubic feet—96 cubic yards (in place).

#### COSTS.

##### Labor—

	Total.	Per Sq. Yd.
Removing old surface (96 cubic yards) .....	\$97 20	11.26 cts.
Hauling 144 cubic yards of Stone and Screenings from Victoria Park Station .....	119 08	13.80
Rolling . . . . .	28 00	3.25
Resurfacing . . . . .	63 16	7.31
Foreman . . . . .	60 20	6.97
	<hr/> \$367 64	<hr/> 42.59 cts.

##### Material—

	Total.	Per Sq. Yd.
2" Stone, 114 cubic yards—136.8 tons at \$1.25 .....	\$171 00	19.82 cts.
Screenings, 30 cubic yards—36 tons at \$1.00 .....	36 00	4.17
Rocmac Solution, 374 gallons at 45c. ....	168 30	19.50
	<hr/> \$375 30	<hr/> 43.49 cts.

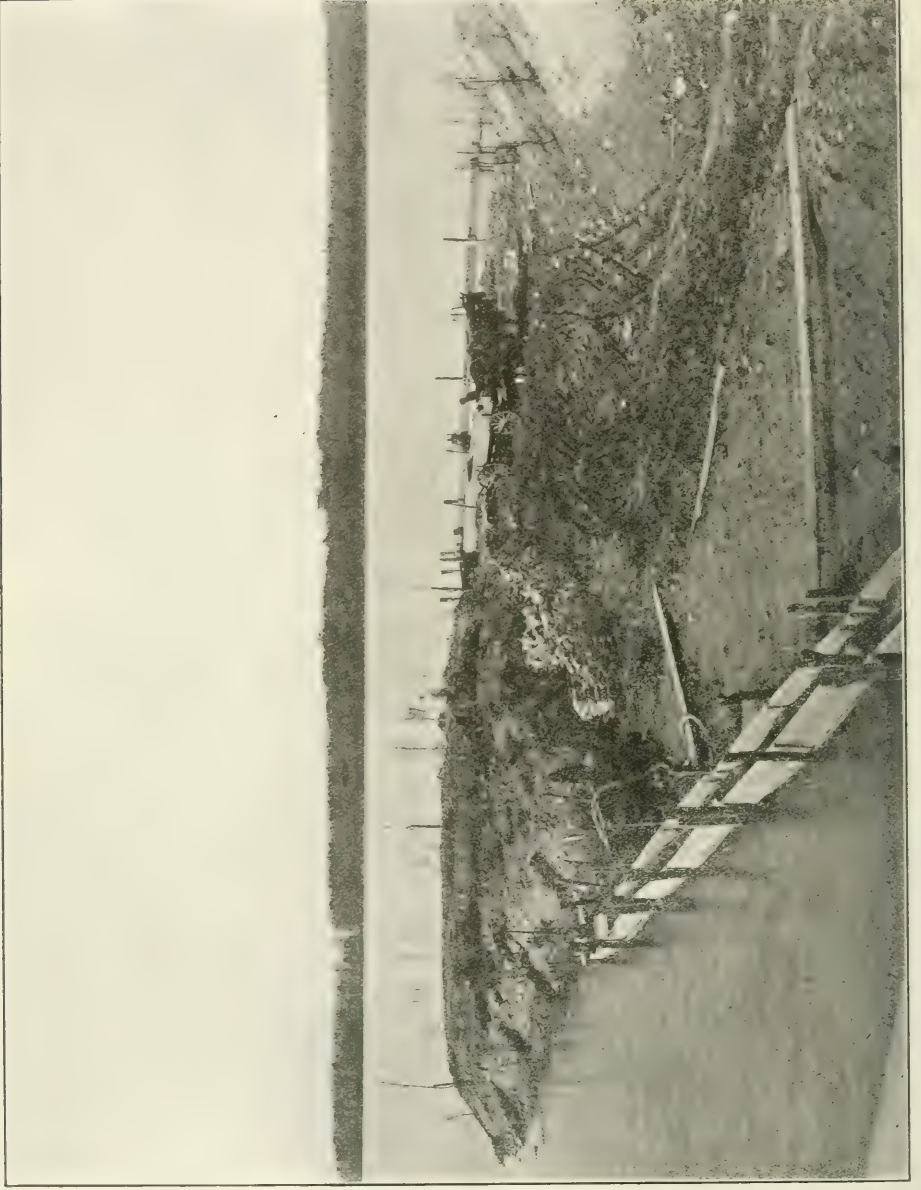
#### SUMMARY.

	Total.	Per Sq. Yd.
Labor . . . . .	\$367 64	42.59 cts.
Material . . . . .	375 30	43.49
	<hr/> \$742 94	<hr/> 86.08 cts.

All of which is respectfully submitted,

JOHN H. JACKSON.  
Superintendent





Creating an island at the mouth of Usher's Creek.



## ANNUAL REPORT OF CHIEF GARDENER.

*To the Superintendent of the Queen Victoria Niagara Falls Park.*

SIR,—I submit herewith my annual report for the year ending December 31st, 1913, which pertains to work done in the Landscape Department, and referred to as follows:

## THE PARK PROPER.

During the year 1913 many important changes in the arrangement of the trees and shrubs were undertaken in the Park proper. At many points, especially at the curves of the roadways and railway tracks, these changes were very necessary as previous plantings had grown to such an extent that views were obscured and sources of danger created. While replanting, the subjects substituted for those removed from the curves were so disposed, that the vision in either direction was not obscured thus precluding the possibility of accidents. The overcrowded nature of the trees and shrubs in or toward the center of what would otherwise be expansive and dignified lawns was likewise a factor which prompted the work of rearrangement. All valuable or rare subjects were preserved, the conifers being utilized in adjacent positions, or planted in the pinetum at the southerly extremity of the Park, while the large deciduous trees were employed in groupings of like species or varieties. Where trees or shrubs interfered with each others growth to the detriment of the weakest a judicious thinning was alone necessary, this being done to an extent compatible with the scheme of ornamentation, the removal of these overcrowded subjects also created beautiful vistas.

The preparation of a topographical plan of the Park proper upon which the landscape designs were based greatly facilitated the arrangement of the various features in a natural and logical sequence. In the work of improvement the desirable features alone were preserved, great care was exercised in this respect, the utility of each receiving the first consideration. The utilitarian and the ornamental were, however, wherever possible, combined. The unification of the existing features with those introduced to enhance the æsthetic qualities of the scheme, and the proportion in which other features should be employed received due consideration so that each would contribute to the harmony of the whole.

## NIAGARA RIVER BOULEVARD.

In the ornamentation of the Niagara River Boulevard the sections were not considered individually, but as a whole, each being so proportionately and relatively adapted as to form units of a harmonious design and to create, when fitted together, a normal state of completeness. To harmonize the various groupings and to maintain organic unity throughout were the objects especially kept in mind when planting the various sections, so that when completed the natural dignity of the environment would not be impaired, but rather enhanced by the naturalistic style of ornamentation adopted. Native trees, particularly those indigenous to the locality, were used almost exclusively for grouping. Exotics, such as Norway Maples and Oriental Planes, were however, employed in the avenues, but whether grouped or aligned the individual groups or rows were composed of trees of one kind. Trees of unusual individuality were not used as a component part of either, but as isolated specimens where occasion demanded.

Along the unfinished sections of the Boulevard practically all the dead trees and debris were removed, the scale-infested fruit trees being burned, thus obviating much labor in spraying and pruning. Much progress was made in grading, seeding and planting, and it is expected that the work of ornamentation will be completed during the year 1914.

In connection with the planting operations an experiment was started on the sections of stiff clay where the ordinary methods were likely to prove unsuccessful, the soil being so impervious as to prevent drainage, proper aeration, and the ramification of roots. Holes dug with the spade were useless and dynamiting was, therefore, resorted to, the 40 per cent. grade being used. Fissures for drainage and aeration were thus opened, and the soil shattered, although not actually ejected. The data relative to the foregoing experiment will, when published, be interesting and instructive. For tree planting purposes considerable quantities of soil were filled into the dynamited holes to afford a rooting medium until the surrounding area will through cultivation and aeration be brought into a fertile condition.

#### COST DATA.

The approximate cost of constructional operations and items are as follows:

Filling, grading, harrowing and seeding during the year 1913	\$14,000.00
Four miles were completed, the cost per mile being .....	3,500.00
Planting, staking, mulching and pruning trees .....	3,000.00
Trees (2,000 planted) .....	1,000.00
Average cost of established tree .....	2.00
Initial cost of each tree .....	50
Four miles of Boulevard were planted, the average cost of ornamentation per mile being \$4,500, or a total for four miles of . . .	18,000.00

For the year 1913 the cost of maintenance of the sections ornamented in previous years amounted to \$1,800. This, however, must not be used as a criterion of the cost of subsequent years as with the completion of the work of ornamentation in sight, the expenditure will decrease on capital account, and increase on maintenance, for as the trees, shrubs and lawns approach maturity they must be properly cared for, otherwise dilapidation will ensue.

#### EXPERIMENTAL WORK.

Among the many new plants under observation in the greenhouses *Primula malacoides* has particularly proved worthy of mention, its description and culture being detailed as follows:

*Primula malacoides*, recently introduced from Yunnan, China, is evidently a valuable acquisition, being a half hardy or cool greenhouse subject. Its delightfully perfumed pale mauve or lilac flowers are borne tier upon tier on long scapes, the flowers comprising each tier with their long pedicels being verticillately arranged along the flowering axis, forming inflorescences which stand well up above the foliage, the deep green of which brings out in bold relief and enhances their delicate tints. The plant is very floriferous and the duration of its flowering period long.

The subject shown in the illustration is one of a batch sown on the 15th of April, 1913, being photographed on the 12th of March, 1914, after five weeks of continuous flowering. Some of the plants commenced to flower at Christmas, and



*Primula Malacoides.*





*White Calceolaria*, a hybrid, raised in the Park Greenhouses.



afforded a magnificent display for more than ten weeks with no apparent diminution in the number of flowers. *Primula malacoides alba*, a white variety of the foregoing, was also grown and like the type proved quite satisfactory either as a pot plant, or as a subject for filling baskets. The feather like sprays fall gracefully so as to form a perfect fountain of bloom through which the green of the leaves is interspersed in attractive combination.

*Culture.*—*Primula malacoides* may be multiplied by seeds or by division of the root stock. In regard to culture no factor should discourage or deter any grower. No greenhouse *Primula* is easier to grow. Soil and general requirements are practically the same as those suited to the Chinese *Primula*—*Primula sinensis*, and to *Primula stellata*. A fairly light soil composed of fibrous loam one third, leaf soil and sand two thirds, screened through a one-half inch screen will for potting purposes suffice. A small quantity of bone meal should be added to the compost. When sowing the seed the surface layer of soil in the seed pan should be screened very finely. As the seed is small it should be covered very lightly, not more than its own depth in any case. Sow during February, March or April. place the pans in a temperature of 55 to 65 degrees, and shade from bright light until germination takes place. As soon as growth is noticed remove the shading material, and when the seedlings crowd each other transfer singly to boxes filled with light soil. When sufficiently large transplant into two inch pots allowing the plants to remain until well established, then repot into fours.

When sufficient roots have been formed to justify the procedure apply a good fertilizer in water once weekly, remove the plants to a cold frame or to a cool shaded part of the greenhouse, afford plenty of air and spray the foliage daily in hot weather, not, however, during the hottest part of the day. Early in October take the plants from the frame, and repot into six or seven inch pots, in which they should flower. As soon as established in these continue to afford liquid manure, as advised, until the flowers are well advanced. After flowering discard the old plants with the exception of a few which may be retained for seed bearing purposes.

When utilized for filling wire baskets a single plant will adequately furnish one of ordinary size. The baskets may be filled ere the flowering stage is reached, or when the plants are in full flower as by either method excellent results are possible.

Respectfully submitted,

H. J. MOORE

Chief Gardener.

## AGREEMENT FOR AERIAL TRAMWAY.

THIS INDENTURE made the first day of November one thousand nine hundred and thirteen.

IN PURSUANCE OF THE ACT RESPECTING SHORT FORMS OF LEASES.

BETWEEN:

THE COMMISSIONERS OF THE QUEEN VICTORIA NIAGARA FALLS PARK, hereinafter called the Lessors,

Of the first Part.

and

ESTUDIOS Y OBRAS de INGENIERIA, a limited liability company organized under the laws of Spain having its principal place of business at Bilbao, Spain, represented by EDMUND G. SPILSBURY of the Borough of Manhattan, City, County and State of New York, its attorney, hereinafter called the Lessees,

Of the Second Part.

WHEREAS the Lessees have applied to the Lessors for permission to construct and operate an aerial tramway extending across the Whirlpool from a location at or near Colts' Point on the west bank of the Niagara River to a location at or near Thompson's Point on the west bank of the Niagara River as shown on the annexed plan, and the Lessors have agreed to allow the Lessees to construct and operate the said aerial tramway and to lease to them sufficient land at the said points whereon to construct and operate the said railway, on consideration of the Lessees paying to the Lessors a minimum rent of \$3,500 a year and in addition thereto a percentage of the gross receipts which the Lessors might receive by operating, or in connection with the operation of the said aerial tramway hereinafter specified.

NOW THIS INDENTURE WITNESSETH that in consideration of the rents, covenants and conditions hereinafter reserved and contained on the part of the Lessees the Lessors have demised and leased unto the Lessees all those two certain parcels or tracts of land situate lying and being in the Township of Stamford in the County of Welland on the west bank of the Niagara River at or near Thompson's Point and at or near Colts' Point which may be more particularly described as follows:

(1) That certain parcel or tract of land at or near Thompson's Point on the west bank of the Niagara River having a frontage on the edge of the cliff of the said west bank of fifty feet and extending back from the said west bank at a uniform width of fifty feet, one hundred feet, which said parcel of land has been heretofore staked by the Superintendent of the Queen Victoria Niagara Falls Park and is marked in blue on the plan hereto annexed, which plan is signed by John H. Jackson, Superintendent of the said Park.

(2) That certain parcel or tract of land situate lying and being in the said Township at Colts' Point on the said Niagara River, and having a frontage on the edge of the cliff of the Niagara River of fifty feet and running back at a uniform width of fifty feet sixty-six feet to the lands of the International Railway Company, which parcel of land has been heretofore staked by the Superintendent of the

Queen Victoria Niagara Falls Park and is marked in red on the said plan hereto annexed.

PROVIDED that the above descriptions shall not be construed so as to include the lands on the slopes lying between the said edges of the cliffs and the water's edge of the river which are hereby excepted from this lease.

TO HAVE AND TO HOLD the said demised premises for and during the term of ten years to be computed from the first day of May, 1914, and thenceforth next ensuing and fully to be complete and ended.

YIELDING AND PAYING therefor yearly and every year during the said term unto the said Lessors and their successors a minimum rent of three thousand five hundred dollars (\$3,500) per year to be payable in quarterly payments on the following days and times, that is to say: August 1st, November 1st, February 1st, and May 1st in each year, first payment to be made August 1st, 1914, and in addition to said rent as additional rental yielding and paying therefor of the gross receipts for each year derived from or in connection with the said aerial railway commencing on the 1st day of May, 1914, above \$35,000 and up to \$45,000, twenty-five per cent., (25%) and of the gross receipts for each said year above \$45,000 and up to \$55,000 thirty-five per cent. (35%), and of the gross receipts for each said year above \$55,000 fifty per cent. (50%).

On the 1st days of August, November, February and May in each year the Lessees covenant and agree to deliver to the Lessors a statement showing the gross receipts of the company during the preceding quarter and shall at the same time pay to the Lessors whatever percentage of the gross receipts such statement shall show the Lessors shall be entitled to over and above the said minimum rent.

The Lessees covenant with the Lessors:

1. To pay rent.
2. And to pay taxes.
3. And to repair, reasonable wear and tear and damage by fire, lightning and tempest only excepted.
4. And that the said Lessors may enter and view state of repair, and that the said Lessees will repair according to notice in writing, reasonable wear and tear, and damage by fire, lightning and tempest only excepted.
5. And will not assign or sublet without leave.
6. Proviso for re-entry by the said Lessors on non-payment of rent or non-performance of covenants.
7. That they will not at any time during the currency of this lease on the said lands build or construct or commence to construct terminal buildings or other structures or any part thereof of any kind or description until they shall have obtained the approval in writing of the Minister of Public Works for Ontario to the plan and specifications therefor, and that they will when such approval has been obtained conform to the said plans and specifications in every particular.
8. That they will during the entire currency of this lease keep accurate books of account in form to be approved of by the Lessors, and that they will faithfully and truly enter in such books of account all their receipts received from the operation of or in connection with the said undertaking and such books of account shall at all reasonable times be open to the inspection of the Lessors' appointee.
9. That the undertaking shall not be opened for operation until approved by the Minister of Public Works for Ontario or his appointee in writing.
10. That no advertising matter excepting the reasonable advertisement of the undertaking shall be located or done on the land or buildings erected thereon.



11. That if at any time or times the plant shall in the opinion of the engineer to be appointed by the Minister of Public Works for the Province of Ontario be or become unsafe all operations of the undertaking shall cease until such repairs or alterations are made therein as are directed by and to the satisfaction of such engineer.

Provided that the Lessee may at the expiration of the said term of ten years renew this lease for a further term of ten years on the same terms and conditions, and the indenture of lease shall contain a like provision for renewal as shall every subsequent indenture of lease of the premises, it being the agreement and intention of the parties that the Lessees shall be entitled to renew this lease for the same period and on the same terms and conditions from time to time as each ten year period expires until the Lessors shall have exercised the option to purchase herein-after contained.

It is agreed between the Lessors and Lessees that at the end of the second ten year period and at the end of each succeeding ten year period the Lessees shall have the right to purchase the aerial tramway including the plant, material, fixtures and structures and other tangible assets of every kind connected with the said undertaking at their then actual value paying nothing for goodwill or any other rights connected therewith.

If any difference shall arise between the parties touching the said actual value then and in every such case the matter in difference shall be referred to the arbitration of three arbitrators, each party to appoint one and the two so appointed to appoint a third arbitrator, and such arbitration shall be under the provisions of the Arbitration Act (Ontario).

The Lessees agree to accept this lease subject to the rights of any and all corporations to or in respect of the said lands, and that they shall have no cause of action or claim against the lessors for any disturbance whatsoever or for any loss which they may sustain or be put to by reason of any act of the Lessors before the execution of this lease.

The Lessees covenant that they will have completed and open for operation the said aerial tramway before the first day of January, 1915.

The Lessees have on the execution of this lease deposited with the Lessors the sum of five thousand dollars (\$5,000) as security for the fulfillment of their covenant to have the said aerial tramway complete and open for operation before the first day of January, 1915, and it is agreed that in the event of the said Lessees not having the said aerial tramway completed and open for operation before the first day of January, 1915, they shall forfeit the said five thousand dollars (\$5,000) to the Lessors as liquidated damages for such breach of covenant, it being the intention that the said sum shall in such case be retained by the Lessees as agreed compensation for such breach of covenant and without any need to prove and irrespective of the actual damages sustained, and this lease shall thereupon be determined and become void and the Lessors may resume possession of the premises.

Provided always that if any part of the said rents whether payable under this lease or in respect of the said renewal term or terms shall be in arrears for thirty days whether legally demanded or not the Commissioners, or if not then an existing corporation, the Government of the Province of Ontario may re-enter on the premises or any part thereof in the name of the whole, and thereupon this lease shall determine and the remainder of the term then current shall terminate as well as any renewal or renewals thereof which under this indenture may be claimed.

The Lessees hereby covenant, promise and agree with the Lessors that they will pay to and indemnify and save harmless the Lessors from all loss, costs and



damages which they may pay, sustain or become liable for in respect of any injury personal or financial which any person, firm or corporation may suffer by reason of any act, neglect or default of the Lessees, their agent or workmen, and that they will pay to the Commissioners all costs between solicitor and client which the Commissioners may pay or become liable for in defending any action which may be brought against the Commissioners for or in respect of any alleged Act, neglect or default of the Lessees whether such action or claim is sustainable or not.

IN WITNESS WHEREOF the corporate seal of the Commissioners has been hereunto affixed by their Chairman who has also signed these presents in certification of the due execution hereof by the Commissioners, and these presents have also been duly executed by the Lessees by their attorney EDMUND G. SPILSBURY duly authorized for that purpose.

SIGNED SEALED AND DELIVERED  
in the presence of  
JEAN WAID.

J. W. LANGMUIR,  
Chairman.  
Queen Victoria Niagara Falls Park.  
(Seal.)

Witness to the signature of E. G.  
Spilsbury.  
M. McINTYRE.

Estudios y Obras de Ingenieria by  
EDMUND GYBBON SPILSBURY  
Attorney in fact.  
New York,  
Nov. 18th, 1913.

#### AGREEMENT FOR TABLE ROCK AND REFECTORY.

THIS INDENTURE made the ninth day of January, one thousand nine hundred and fourteen.

IN PURSUANCE OF THE ACT RESPECTING SHORT FORMS OF LEASES.

BETWEEN :

THE COMMISSIONERS FOR THE QUEEN VICTORIA NIAGARA FALLS PARK, hereinafter call the Commissioners,

Of the First Part,

and

ROBERT P. SLATER of the City of Niagara Falls in the Province of Ontario, merchant, hereinafter called the Lessee,

Of the Second Part.

WITNESSETH that in consideration of the rents, covenants and agreements, hereinafter reserved and contained on the part of the Lessee, for himself his executors, administrators and assigns to be paid, observed and performed, the Commissioners have demised and leased, and by these presents do demise and lease unto the Lessee, his executors, administrators and assigns, all these messuages or tenements situate in the City of Niagara Falls within the Queen Victoria Niagara Falls Park System known as the Park proper, and known as the Table Rock House, and part of the building known as the Refectory Building together with the rights

and privileges hereinafter specified but subject to the conditions and stipulations hereinafter specified, the said rights and privileges to be held and enjoyed by the said Lessee, his executors, administrators and assigns, as appurtenant as a whole to the demise and lease of the said buildings.

TO HAVE AND TO HOLD the said demised premises together with the said rights and privileges as aforesaid for the term of one year from the date hereof when the same is to be fully complete and ended.

AND IT IS HEREBY AGREED by the parties hereto that the rights and privileges hereinbefore mentioned to be held and enjoyed as appurtenant as a whole to the demise and lease of the said buildings, and the stipulations to which the said rights and privileges are subject are as follows:

#### HYDRAULIC LIFT AND TUNNEL.

(1) The exclusive right of the Lessee to use the electric elevator at Table Rock House, for which the Commissioners are to furnish or procure to be furnished the motive power together with the right to take visitors under the Falls by means of the existing tunnel, with the use of dressing rooms in the Table Rock House, and the collection of tolls from visitors for such uses.

(2) The tolls collectable from visitors for the use of the elevator, tunnel, etc., including charges for guides and suitable apparel, shall not exceed, for each visitor going under the Falls (provided by the Lessee with oiled dress and guide) fifty cents.

(3) For each visitor going under the Falls, including the use of the elevator, without guide or dress, twenty-five cents.

(4) Subject to the following stipulations, to be observed, kept and performed by the Lessee.

(5) To keep the electric elevator in a good state of repair, and to protect the same from frost during the winter.

(6) To keep the tunnel and the several portals appertaining thereto, together with such paths below the cliff as the Commissioners may authorize to be constructed, in good order and condition.

(7) The foregoing repairs, protection, order and condition to be kept and maintained to the satisfaction of the Superintendent of the Park, as also the protection afforded to visitors, and the method of conducting the business.

(8) The tunnel and paths under the cliff may be extended and improved from time to time by the Lessee, but such extension and alterations are to be made according to plans approved of by the Park Commissioners.

#### PHOTOGRAPH BUSINESS.

(9) The exclusive right to take and produce for purposes of sale within the Park, photographs of scenery and persons, individually and in groups.

(10) The photographs and pictures may be exposed and offered for sale in the Table Rock House, or Refectory, or both, and the rights shall include the right to sell fancy goods and souvenirs in the Table Rock House and Refectory for the purpose in the rooms allotted, but such sales of photographs, pictures and fancy goods and souvenirs shall not be elsewhere within the Park, than as herein specified.

(11) Solicitation for taking persons under the Falls, taking photographs of scenery, and of persons, and for the sale of photographs and photographic views, to be confined to the rooms and premises occupied by the Lessee and for the sale of

fancy goods and souvenirs to be confined to the rooms allotted for sale of photographs, and not elsewhere within the Park.

(12) The line and description of fancy goods and souvenirs sold or offered for sale, shall from time to time be subject to the approval of the Superintendent, and the Lessee shall not sell nor offer for sale fancy goods or any line or class of fancy goods which he may forbid the Lessee to sell.

#### RESTAURANT IN THE REFECTORY BUILDING AND REFRESHMENTS.

(13) The exclusive right to keep a restaurant in the building known as the Refectory.

(14) The portions of the Refectory Building to be occupied by the Lessee shall be limited to the following, namely:

(a) On the ground floor, the scullery, ice boxes, pantry, north furnace and coal rooms, small lunch room, and the large lunch room to the wire partition defining the main passage.

(b) On the first floor, the large dining room and two private dining rooms, the serving rooms, pantry, kitchen, north verandah and the large verandah east of the north half of the large dining room on the front, and part of the rest room twelve feet by eighteen feet adjoining the dining room.

(c) On the second floor, the printing room, south dark room, seven bedrooms and sitting room, two rear bath rooms, corridor and closets.

(d) The attic: The portions of the said Refectory Building leased hereby are shown in red on the plans attached hereto.

(15) The Lessee during the currency of this lease covenants and agrees that in addition to the meals "A la carte" they will furnish meals to all the public desiring them at all hours at fifty cents per meal, and another meal at seventy-five cents per meal, such meals to be of a quantity and quality satisfactory to the Commissioners' Superintendent, and that at the counter restaurant on the ground floor the charge for any single article is not to exceed five cents excepting that ice cream may be sold at five and ten cents per dish.

(16) No other restaurant shall be permitted by the Commissioners in the Park, but the Lessee shall have the exclusive right to sell refreshments at such points within the Park (if any) where the Commissioners may decide to permit refreshments to be sold, but the manner of doing such business and the accommodation to be furnished to visitors at such points shall be described from time to time by the Lessee to the Superintendent in writing and shall not be deemed allowed until the Superintendent shall have signified his assent in writing.

(17) The Lessee shall not be permitted to take boarders or lodgers in any of the premises to be occupied by him under these presents, nor shall he permit any person to reside or lodge in the said premises except such as are employed in the occupations to be carried on under these presents.

(18) Nor shall the Lessee permit a greater number of persons employed as aforesaid to reside or lodge in the said premises than such number as may from time to time be deemed unobjectionable by the Superintendent.

(19) The persons employed by the Lessee coming in contact with the public shall be clothed in proper uniform and if their conduct, or the conduct of any other person employed by the Lessee shall be such as to be disapproved by the Superintendent, the Lessee shall forthwith dismiss such person from his employment upon being required to do so by the Superintendent.

(20) Yielding and paying therefore the sum of seventeen thousand dollars



for the said term payable in four equal instalments in advance on the following days and times in succession, that is to say, the sum of four thousand two hundred and fifty dollars on the ninth day of January, 1914, the sum of four thousand two hundred and fifty dollars on the ninth day of April, 1914, the sum of four thousand two hundred and fifty dollars on the ninth day of July, 1914, and the sum of four thousand two hundred and fifty dollars on the ninth day of October, 1914, together with five per cent. of the gross receipts derived by the Lessee from all sources connected with the business to be carried on by the Lessee as such Lessee payable as follows: Five per cent. of the gross receipts received by the Lessee during the first three months on the ninth day of April, 1914, five per cent. of the gross receipts received by the Lessee during the second three months of said term on the ninth day of July, 1914, five per cent. of the gross receipts received by the Lessee during the third three months of the said term on the ninth day of October, 1914, five per cent. of the gross receipts received by the Lessee during the tenth and eleventh months on the ninth day of December, 1914, and five per cent. of the gross receipts received by the Lessee during the twelfth month on the ninth day of January, 1915.

The Lessee covenants with the Commissioners that he will keep such books and in such form as the Superintendent shall from time to time prescribe, and will therein in such manner and in such detail as the Superintendent shall direct at the close of each day during said term enter fully, truly and correctly the amount of the said gross receipts received by him as aforesaid on each day, and that he will produce said books in the office of the Commissioners in the Park, and allow the Superintendent or any other person authorized by the Commissioners to examine said books whenever and as often as requested by the Superintendent or the Commissioners so to do.

The Lessee further covenants that he will during said term, deposit the total receipts for each day at latest on the succeeding day (or on the next banking day) in a bank in a separate account and will always keep an amount equal to the five per cent. payable to the Commissioners in said account, and will produce said bank book at said office for inspection when requested by the Superintendent or other person authorized by the Commissioners to inspect same.

That the said Lessee covenants with the Commissioners jointly and severally in manner aforesaid to pay rent, and to pay all municipal taxes or school rates which are legally chargeable against the Commissioners by reason of their occupation of the premises in manner and form hereby demised to them, and to repair and in manner and as hereinbefore provided. And that the Commissioners and Superintendent of the Park or either of them may enter and view state of repair and that the said Lessee will repair according to notice, and that in respect of the repair of the elevator or the protection thereof from frost during the winter, on such notice as the Superintendent shall fix and leave in writing on the premises.

And that the Lessee will not assign or sub-let without leave, and that he will leave the premises, including the elevator, tunnels, portals and paths in connection with the tunnel in good repair.

Proviso for re-entry by the Commissioners on non-payment of rent or non-performance of covenants.

The said Commissioners covenant with the said Lessee for quiet enjoyment.

And the Commissioners covenant with the Lessee, his executors, administrators and assigns, that they will not grant or confer upon any other person, or upon any company, any of the rights and privileges contained in the paragraphs numbered one to nineteen inclusive, provided that the Lessee, his executors, admin-



istrators or assigns shall duly observe and perform upon their part all matters and things by them or any of them undertaken to be done, observed and performed in any by these presents.

IN WITNESS WHEREOF the party hereto of the second part has hereunto set his hand and seal the day and year first above written, and the parties of the First Part have hereunto affixed their corporate seal under the hand of J. W. Langmuir their proper officer.

Witness:

JOHN H. JACKSON.

} R. P. SLATER, (Seal.)  
J. W. LANGMUIR, (Seal.)  
Chairman.

COUNTY OF WELLAND.

} I, John Herbert Jackson, of the City  
of Niagara Falls in the County of  
Welland, Civil Engineer, make oath  
and say:

1. That I was personally present and did see the annexed instrument and duplicate thereof duly signed, sealed and executed by Robert P. Slater one of the parties thereto.

2. That the said instrument and duplicate were executed by the said party at the City of Niagara Falls.

3. That I know the said party.

4. That I am a subscribing witness to the said instrument and duplicate.

SWORN before me at the City of  
Niagara Falls in the County of  
Welland, this 29th day of January,  
1914.

} JOHN H. JACKSON.

F. C. MCBURNEY,

A Commissioner, etc.

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## QUEEN VICTORIA NIAGARA FALLS PARK SYSTEM.

## BY-LAWS, REGULATIONS AND TOLLS.

*Approved by the Lieutenant-Governor in Council, 31st day of March, A.D. 1914.*

## PROTECTION TO PARK PROPERTY.

Injuring and defacing.

1. (a) No person shall climb, break, cut, trample upon, remove, or in any way injure or deface any ornament, tree, plant, shrub, flower, flower-bed, turf, sign, seat or any of the fences, bridges, buildings or other constructions within the Park; nor shall any person write upon any fence, bench, seat, rock, stone or structure. No animal shall be tied to any tree, shrub or structure whether movable or immovable within the Park, except as provided for that purpose.

Refuse dumping.

(b) No person shall throw, dump, or cause to be thrown or dumped any ordure, filth, dirt, wood, ashes, stone or substance within the Park, or along, or over the river bank, or talus embraced in the Park System. All papers, litter, refuse, garbage or rubbish of any kind, shall be placed in cans or baskets where provided for that purpose, and throwing of litter, etc., upon the ground is forbidden.

Animals at large.

(c) No horse or other animal shall be allowed to go at large in the Park, except that dogs may be allowed therein, when led by a chain or proper dog-leash not exceeding six feet in length.

Firearms and fireworks.

(d) No person shall carry any gun, pistol or other firearm, or fire or discharge any torpedo, rocket or other firework, without the written permission of the Park Superintendent so to do; nor shall any person kindle or build fires unless under the supervision of an authorized Constable or Caretaker within the Park.

Construction work.

(e) No driveway or foot path shall be constructed upon Park property, except under written permit from the Park Superintendent, nor shall any person open, dig up or tunnel under any part of the Park System. No person shall remove any house or building on, along or across any part of the Park System, except under written permit from the Park Superintendent.

Grass, lawn and turf.

(f) No person shall stand, walk, ride or lie upon any place laid out and appropriated for shrubbery, flowers, lawn or turf, where a warning or sign forbidding the same has been placed.

## DEPARTMENT OF VISITORS.

Conduct and language.

2. (a) No person within the Park shall utter loud, threatening, abusive or indecent language, or any language tending to create a breach of the peace; or be guilty of any indecent, obscene or disorderly conduct; or wilfully violate any directions for visitors.

Gambling.

(b) No card playing or game of chance shall be permitted within the Park.

Intoxicated persons.

(c) No intoxicating liquors or beverages shall be brought or caused to be brought and drunk within the limits of the Park, nor shall any intoxicated person enter or remain upon any portion of the Park System.

## RECREATIONS, AMUSEMENTS AND CELEBRATIONS.

3. (a) All picnics within the Park shall be under the supervision of the Park Superintendent, and may be held in such places only, and at such times as he may allow. All persons using or visiting the play grounds or picnic grounds do so at their own risk. The Park Commissioners shall not either directly or indirectly be held responsible or liable for any injury or damage that may occur to any person, persons or property while on Park grounds. Picnics and games.

Nor shall the Commissioners or any of them be held responsible for any accident or damage that may arise or occur to any visitor or visitors to the Park while using the stairs, platforms or structures placed for the use and convenience of the public whether free or whether a charge is made for the use of same. Athletic games, sports and other forms of recreation or amusement sanctioned by the Board of Park Commissioners may be held or practised in such parts of the Park as shall be designated for such use, under the supervision and control of the Park Superintendent, and subject to the orders of any Constable or other officer on duty connected with the Park System.

(b) No child under twelve years of age shall enter or remain upon the Dufferin Islands, bathe, fish or play along the river bank unless accompanied by, and in charge of some person of mature years. Care of children.

(c) Wading or bathing within the limits of the Park shall be permitted only in the swimming pool at Dufferin Islands, or at points designated from time to time by the Park Superintendent, and such wading or bathing shall be under his supervision and control. Fishing shall be permitted only in the waters of the Niagara River. No basin, pond or fountain shall be fouled by stone, wood or any other substance, or bathed in or waded into. No wild fowl or animal shall be killed caught or disturbed in any manner. Bathing and fishing.

(d) The Commissioners or Park Authorities shall not be held responsible for the value of any goods, money or other articles that may be lost, misappropriated or stolen while bathers, excursionists or other visitors are within the limits of the Park System. Any person finding an article lost within the Park shall immediately deliver the same to an officer of the Board or at the Park Office leaving his address so that in the event of the owner not being found the article may be returned to the finder. Any officer, workman or employee finding an article lost within the Park, or having such an article delivered to him by any person shall at once report, and hand the same in at the Park Office. Any article found within the limits of the Park System and returned to the Park Office will be returned to the owner upon proper identification. Lost and found.

(e) No person shall play upon any musical instrument, carry or display any flag, target or transparency; nor shall any military or private company, band or procession parade, march or drill, or perform any evolution, movement or ceremony; and no person shall do any act tending to congregate persons without written permission from the Park Superintendent so to do within the limits of the Park System. No funeral procession shall pass through the Park. Provided that from any house along the Boulevard, a funeral procession may pass along the Celebrations and processions.



road to the nearest cross street or road in the direction in which the procession is proceeding.

Entering  
parks.

(f) Entrance to the Park shall be free, but subject to such restrictions and regulations as the Commissioners may from time to time direct. No one shall enter or leave the Park except at the established entrance ways. Any person or persons within the Park limits between sunset and sunrise shall state their business, if required to do by the Constable or Caretaker on duty at that time.

#### TRAFFIC ON HIGHWAYS.

Acts which  
govern.

4. (a) The Motor Vehicles Act and the Highway Travel Act of the Statutes of Ontario, Canada, with the amendments thereto shall govern all highway traffic within the Park, except as hereafter provided.

Speed limit.

(b) No horses, motor cars, bicycles or vehicles shall be driven or run along or over the roadways within the limits of the Park at a higher rate of speed than ten miles per hour, save and except along or over that portion of the Park known as the Niagara River Boulevard, which extends southerly from the southerly limits of Queen Victoria Park along the shore of the Niagara River to the northerly limits of the Village of Bridgeburg, where through, along or over the said Boulevard the speed limit allowed shall be twenty miles per hour; provided always that the said horses, motor cars, bicycles or vehicles must conform to the speed limits which may now or hereafter be stipulated by By-law for, along, through or over the streets of any city, town, village or hamlet, through which the said Boulevard roadway passes. Provided further that no person shall drive along or over the roads or drives of the Park at a rate of speed greater than is reasonable and proper, having regard to the traffic and use of the highway, or so as to endanger the life or limb of any person, or the safety of any properties.

Non-skidding  
devices.

(c) No person shall run or drive any motor car, bicycle or other vehicle on the highways of the Park, on any of whose wheels is a tire chain or non-skidding device, except when such highways are covered with sleet, ice or snow.

Traffic areas.

(d) No animal or vehicle of any description shall be allowed to travel within the Park, except upon roadways or other places appropriated for such animals and vehicles, nor will any animal or vehicle be allowed upon any foot path; nor will any animal or vehicle be allowed to stand on any roadway, except at such places as the Park Superintendent may designate for such purpose. Bicycles may be ridden on the roadways or upon such bicycle paths as the Park Superintendent may from time to time direct, conforming in all cases to the speed limit governing the area traversed.

Vehicles for  
hire.

(e) No person shall solicit or invite passengers for any coach or other vehicle for hire within the Park, nor shall any hackman, driver or chauffeur of any vehicle for hire leave his vehicle unattended while in the Park. All hackmen, drivers or chauffeurs of vehicles for hire shall demean themselves in an orderly and respectful manner, and for any breach of this or any By-law, or for any extortion or attempt at extortion or misrepresentation by any hackman, driver or chauffeur from, or to any person carried or driven by him to, or in said Park or any part



thereof, the person so offending may be excluded by the Park Superintendent from the Park for such length of time as said Superintendent may direct, and in addition such person shall be liable for the penalties hereinafter provided.

(f) No wagon, cart, dray, truck or other vehicle for the carrying of, or laden with, merchandise, wood, coal, hay, manure or material of any kind shall be permitted on the roadways of the various Parks, except for the purpose of delivering material to points within said Parks. No wagon, cart, dray or other vehicle for carrying materials over the Boulevard roadway from Chippawa to Bridgeburg having a carrying capacity of two thousand pounds or over shall have tires on the wheels of such vehicles less than three inches in width, and all wagon boxes, racks, or platforms on any conveyance used for freighting or trucking along or over the Boulevard shall be so constructed and so loaded that no material shall fall therefrom to the roadway or any adjacent area. No traction engine shall be allowed to traverse the roadways of the Park System, except upon the Boulevard roadway between Chippawa and Bridgeburg, for the use of owners or tenants of properties abutting on the Niagara River Boulevard, and then only when strips of wood have been wired securely between the lugs on the tires of the wheels so as to prevent the tearing up of the road surface by the operation of the said engine. Slow moving vehicles will keep close to the curb. Trucking and freighting.

(g) No animal shall be driven along, over or through the Park, except that animals may be driven along or over the Boulevard for the purpose of watering in the upper Niagara River, but such watering of animals must be accomplished so that said animals shall be confined to existing runways to the water's edge to prevent injury to the grass, sward, turf, shrubs or trees in that vicinity. Cattle driving.

(h) No person shall place or deposit, nor allow to be placed or deposited on the roadways of the Park, or any part thereof, any material without permit from the Park Superintendent so to do, and every person using any portion of the said roadway, or any part thereof, under such permit for the purpose of erecting or repairing any building, or for the placing or keeping any building material or any other article or thing thereon which will be an obstruction or in any respect dangerous to travel shall cause two or more red lights to be placed in conspicuous places from sunset until sunrise of each day until the obstruction is removed, and shall construct and maintain proper safe guards around or over such obstruction. No such permit shall be granted under this clause unless in the application therefor the party applying shall agree to indemnify the Park Commissioners against all liability for injury to any person or property arising from such obstruction. Obstructions to traffic.

#### PERMITS AND LEASES.

5. (a) It shall be unlawful for any person or persons to expose or cause to be exposed any article or thing for sale, to do any hawking or peddling, to distribute dodgers, or to erect for any purpose a booth, tent, stall or other structure on Park or Boulevard property, provided that nothing herein contained shall be construed to prevent the carrying on of any business or enterprise sanctioned by lease or permit from the Board of Park Commissioners. Sale of wares

Advertising. (b) No vehicle displaying a placard or advertisement of any kind shall be driven on the roadways of the Park for advertising purposes, nor shall a placard, notice or advertisement of any kind or nature be distributed, posted or attached to anything movable or immovable within the limits of the Park System, save under permit from the Park Superintendent. No person shall injure, deface or destroy any notice, rule or by-law posted in the Park.

Soliciting contributions. (c) No person shall beg or tell fortunes, solicit patronage to or for any person or persons, occupation or business; nor shall any person within the limits of the Park System beg, solicit or invite subscriptions or contributions to or for anything whatsoever, except under permit from the Park Superintendent so to do.

Tolls. (d) The following tolls shall be taken and collected for the use of works, appliances, and for services within the Park:

1. For each person using the lift at Table Rock without waterproof suit or guide .....	\$0 25
2. For each person using the lift at Table Rock with waterproof suit and guide .....	0 50
3. For each person using the stairway at Brock's Monument.....	0 15
4. For opening and closing graves at Lundy's Lane Cemetery:	
(a) A child under six years.....	2 00
(b) A child between the ages of six and twelve years.....	3 00
(c) A person over twelve years of age.....	5 00
(d) An additional charge for each funeral held on Sunday.....	2 00

### JURISDICTION OF BY-LAWS AND PENALTIES.

Areas included. 6. (a) In these By-laws and any amendments and additions hereto the words "Park," "Parks" or "Park System" shall mean and include Queen Victoria Park at Niagara Falls, Queenston Heights Park, Niagara Glen, the old fort grounds at Fort Erie, Lundy's Lane Burying Ground, Butler's Burying Ground at Niagara-on-the-Lake, the Niagara River Boulevard, and all other lands which are now, or may hereafter be, vested in, or come under the control of the Queen Victoria Niagara Falls Park Commissioners.

Prosecution. (b) No prosecution shall be maintainable for any breach of any of these By-laws excepting by some person acting under the authority of the Park Commissioners or the Park Superintendent.

Penalties. (c) Every person charged with a breach of any of the foregoing By-laws shall upon conviction before any Magistrate or Justice having jurisdiction in the premises be liable for every such breach or offence to a penalty not exceeding twenty (\$20) dollars.

### NOTICE.

It is the duty of Employees to enforce the By-Laws and Regulations. Visitors are requested to report any violation, extortion or attempt at extortion, and any neglect of duty on the part of employees.

JOHN H. JACKSON,  
Superintendent.

ORDER-IN-COUNCIL APPROVING OF BY-LAWS, REGULATIONS  
AND TOLLS.

Copy of an Order-in-Council approved by His Honour the Lieutenant-Governor, the 31st day of March, A.D. 1914.

Upon the recommendation of the Honourable the Minister of Public Works, the Committee of Council advise that pursuant to section 15, Chapter 50, R.S.O. 1914, and sub-section 2 of section 4, Chapter 51, R.S.O. 1914, the accompanying By-laws, Regulations and Tolls for The Queen Victoria Niagara Falls Park System made by the Commissioners of The Queen Victoria Niagara Falls Park under the powers conferred upon them by the said Acts be approved by Your Honour.

Certified,

J. LONSDALE CAPREOL,

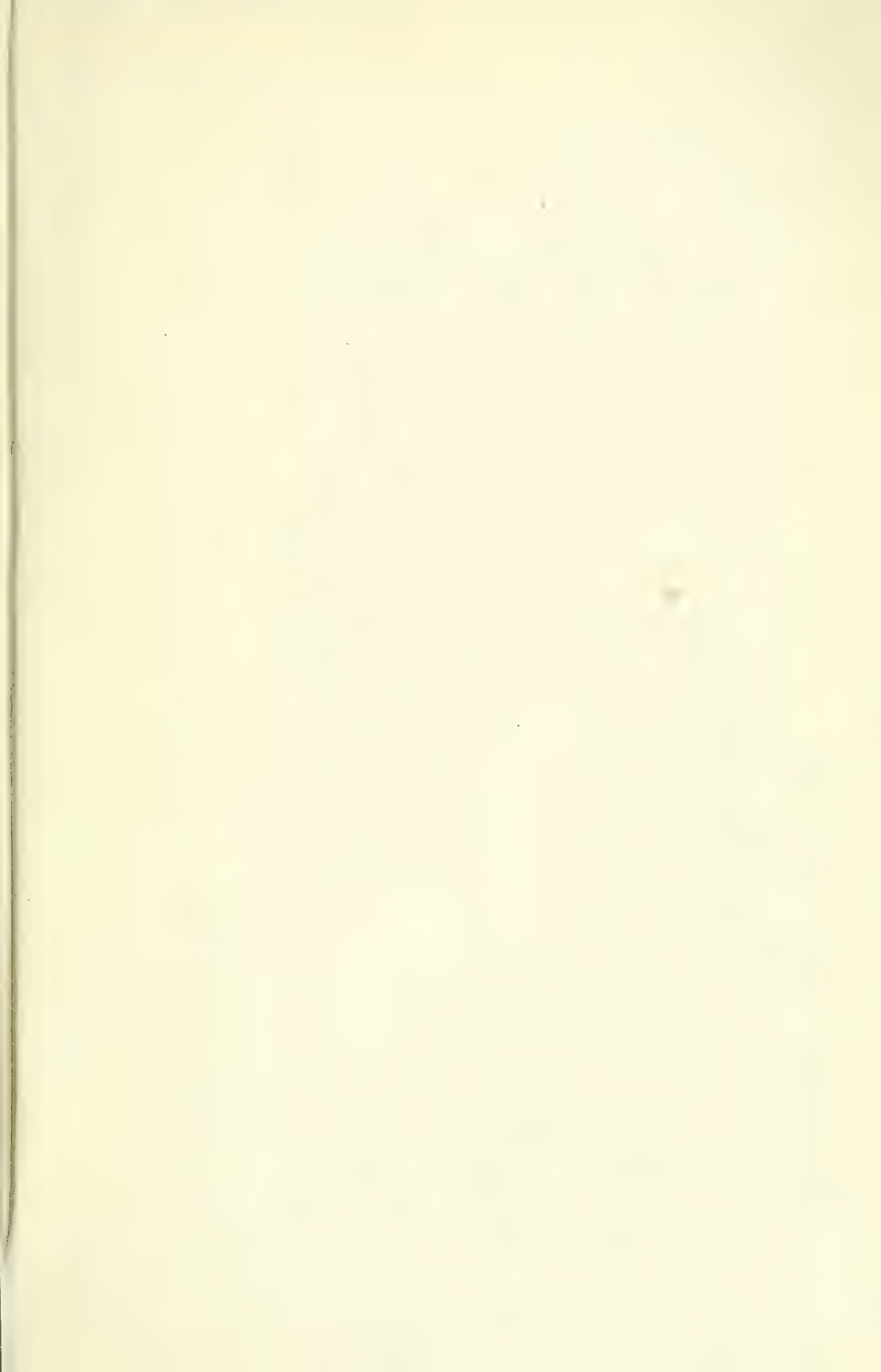
*Clerk, Executive Council.*

## QUEEN VICTORIA NIAGARA FALLS PARK.

### INDEX TO APPENDICES.

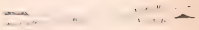
Year	Title	Date	Page
1913	Report of the Park Superintendent .....	December 31st, 1913 ...	18
	Report of the Chief Gardener .....	December 31st, 1913 ....	25
	Agreement for Aerial Tramway.....	November 1st, 1913.....	28
	Agreement for Table Rock and Refectory .....	January 9th, 1914 .....	31
	By-laws, Regulations and Tolls for Queen Victoria Niagara Falls Park System .....	March 31st, 1914 .....	36
	Order-in-Council approving of By-laws, Regulations and Tolls .....	March 31st, 1914 .....	41











# LEGEND

**Quartz and Biotite**

Quartz and Biotite (see page 10)

**PRE-CAMBRIAN**

Quartz and Biotite

**INTRUSIVE CONTACT**

Coal Series

Quartz and Biotite (see page 10)

**COAL SERIES**

Quartz and Biotite (see page 10)

**POST-CAMBRIAN**

Quartz and Biotite (see page 10)

**INTRUSIVE CONTACT**

Coal Series

Quartz and Biotite (see page 10)

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Quartz and Biotite (see page 10)

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Coal Series

Quartz and Biotite (see page 10)

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Coal Series

Quartz and Biotite (see page 10)

**COAL SERIES**

Quartz and Biotite (see page 10)

**INTRUSIVE CONTACT**

Coal Series

Quartz and Biotite (see page 10)

**COAL SERIES**

Quartz and Biotite (see page 10)

## NOTES

Date of

Page 10





Township and mining location plans from surveys  
Branch, Department of Lands, Forests and Mines,  
Ontario.

Map of Southern Gold Area, accompanying report  
by E. L. Brown, Twenty First report of Bureau of Mines,  
Ontario, 1912.

Lake elevations from bench level determinations based  
on leveling and Northern Railway surveys, also  
road and lake traverses by W. R. Rogers and  
R. M. Smith.

Geology by A. G. Burrows and P. E. Hopkins.

## MINING LOCATIONS

### TECK AND OTTO.

Swastika; R.S.C. 304, E. and N. lot 8, con. vi, Otto.

### TECK AND LEBEL

Burnside Syndicate; L. 1821-2-3.  
Tough-Oakes Gold Mines; H.R. 140-1-2-3-4.

### TECK

Horton; 1880-1.  
Lucky Cross; T.O. 57-8-9, 60.  
Oakes; L. 1567, 1602.  
Robbins; L. 2100.  
Teck-Hughes; L. 1238-39, 40.  
Wetlands; 1624-5-6.  
Wood; L. 1230.  
Wright-Hughes; T.O. 108-9, 10.

### LEBEL

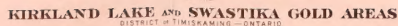
Dane Mining Co (copper); H.L. 140-1-2-3.

### MOHRISSETTE

Costello; L. 2194, 2205.

### GAUTHIER AND McVITTIE

Horton; L. 2296-7-8-9, 2301-2.



Wm. W. Howell, *Minister of Lands, Forests and Mines.*      Willet G. Miller, *Provincial Geologist.*  
Scale: 1" = 10 Miles. 1" = 1 inch.



The region was first visited by Mr. M. H. White, who in 1891 made a reconnaissance of the area, and in 1892 Mr. L. B. Ballou, who accompanied Newell's survey party, reported on the geology of the country. The latter was the first to give a description of the rocks to the U. S. G. S. Mr. Miller examined the coal region of Britain and the coal fields of the West Virginia and Kentucky basins made the first detailed examination of an open surface. The work, which included the position of the levelled surface, was published in 1894 in the *Geological Survey of Kentucky* First Annual Report of the Bureau of Mines, showing the position of the levelled surface, the position of the levelled surface, and the geological structure of the region, with the Tullahoma fault, which was prepared by Mr. M. H. White for the Geological Survey of Kentucky.

**Veins of Kirkland Lake Area**

Most of the veins northeast of Brantford in the Kirkland Lake area. The principal rock is greywacke and conglomerate of the Hamiltonian series. There have been intrusions of lacoporphyr and basic diorite and gabbro. Good bedding has been found in the conglomerate and greywacke near the contact with the porphyry, and in the porphyry. Veins have also been found which have been traced from the contact

**Analyses**  
The chemical analyses were made by Mr. W. E. McQuill, Portland, Oregon.



BINDING SECT.-AUG 25 1967

